VOLUME VIII JUNE, 1915 NUMBER 6

Southern Medical Journal

Journal of The Southern Medical Association

THE TRUTH AND THE TRUTH ONLY ON EVERY PAGE FROM COVER TO COVER

TABLE OF CONTENTS

MEDICINE.

Syphilis of the Heart. Stewart R. Roberts, Atlanta, Ga. 447

Concerning Syphilis in the American Negro. Kenneth M. Lynch, B. K. McInnes and G. Fleming McInnes, Charleston, S. C. 450

Report on the Treatment of Some Typical Cases of Syphilis of the Central Nervous System. J. P. Munroe and A. J. Crowell, Charlotte, N. C. 456

Treatment of Syphilis. E. H. Martin, Hot Springs, Ark. 468

Etiology and Treatment of Tabes Dorsalis and Specific Paresis. Estill D. Holland, Hot Springs, Ark. 466

Atypical Neurological Syphilis. Beverley R. Tucker, Richmond, Va. 470

Syphilis Symposium Discussed by E. G. Ballenger, Atlanta, Ga.; James K. Hall, Richmond, Va.; A. J. Crowell, Charlotte, N. C.; Lewis W. Elias, Asheville, N. C.; I. W. Falson, Charlotte, N. C.; W. W. Hawke, Philadelphia, Pa.

Some Facts Pertaining to the Wassermann Reaction in Relation to Diagnosis and Treatment. R. B. H. Gradwohl, St. Louis, Mo. 477

A Simple and Efficient Contrast Stain for B. Diphtheriae. G. McF. Mood, Charleston, S. C. 482

AUTHORS' ABSTRACTS: Two and a Half Years' Experience with the Phenosulphonephthalein Test, Samuel Logan, New Orleans, La.—**Some Clinical Observations of Mouth Infections as a Source of Systemic Diseases,** L. P. Robertson, Marlin, Texas.—**Subacromial Bursitis,** Sterling O. Fields, Newport News, Va.—**Use of Raw Starch in Treatment of Diabetes Mellitus,** E. B. Knerr, Kansas City, Mo.—**The Treatment of Diabetes Mellitus and Its Underlying Principles,** Jacob Gutman, Brooklyn, N. Y.—**Pleurisy with Effusion,** John Staige Davis, University, Va.—**Occurrence of Exudates During Treatment by Artificial Pneumothorax,** A. G. Shortle, Albuquerque, N. W.—**Some Observations on the Nervous and Mental Symptoms of Heart Disease,** Joseph Irwin France, Baltimore, Md. 483

TROPICAL DISEASES AND PUBLIC HEALTH.

Fifty Cases of Intestinal Parasites in Adults, With an Attempt to Study Some Symptoms Caused by Them. H. L. McNeil, Galveston, Texas. ... 486

Discussed by Randolph Lyons, New Orleans, La.

Sanitary Markets. Mosby G. Perrow, Lynchburg, Va. 494

Discussed by Roy K. Flannagan, Richmond, Va.

AUTHORS' ABSTRACTS: The Propagation of Amoebic Dysentery in Animals and the Recognition and Reproduction in Animals of Atypical Forms of the Disease, Andrew W. Sellards and Walter A. Baetjer, Baltimore, Md.—**The Purity and Strength of Household Remedies,** Martin I. Wilbert, Washington, D. C.—**Occurrence of Yaws in United States,** E. J. Wood, Wilmington, N. C.—**Some Facts and Discoveries Concerning the So-Called Continued Malarial Fever,** J. H. McCurry, Grubbs, Ark.—**The Late Outbreak of Plague in Havana,** Aristides Agramonte, Havana, Cuba. ... 497

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES.

Conservative Treatment of Fractures. R. W. Knox, Houston, Texas 499

Treatment of Ununited Fractures. Hugh H. Trout, Roanoke, Va. 502

Papers of Drs. Knox and Trout discussed by R. L. Payne, Jr., Norfolk, Va.; J. Shelton Horsley, Richmond, Va.; H. P. Cole, Mobile, Ala.; Carroll

(Concluded on first ad. page)

"Chicago Laboratory, 25 E. Washington St., Chicago, Ill., see page XVII."

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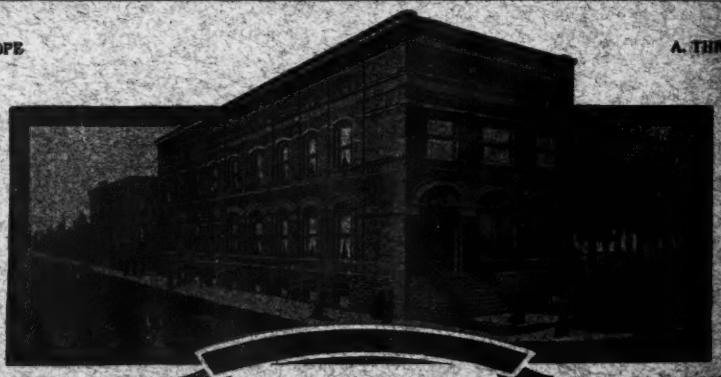

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TABLE OF CONTENTS—*Concluded*

W. Allen, New Orleans, La.; Duncan Eve, Nashville, Tenn.; Jere L. Crook, Jackson, Tenn.; Jos. A. Danna, New Orleans, La.; and R. L. Turner, Meridian, Miss.

Threatened and Real Gangrene of the Extremities as Seen by the Modern Surgeon. Its Causes and Treatment. Bertram M. Bernheim, Baltimore, Md. 512

Discussed by LeGrand Guerry, Columbia, S. C., and J. C. Bloodgood, Baltimore, Md.

Recent Experiences in Spinal Surgery. R. Tunstall Taylor, Baltimore, Md. .. 517

Discussed by Michael Hoke, Atlanta, Ga.; Alexius McGlannan, Baltimore, Md.

AUTHORS' ABSTRACTS: Side-to-Side Ileo Colic Anastamosis for Obstruction in Caecal Region, A. P. Crain, Shreveport, La.—**Gall-Bladder Disease,** J. H. Carter, Memphis, Tenn.—**How to Sharpen a Scalpel,** V. Berry, Okmulgee, Okla.—**Inversion of the Uterus.** W. O. Roberts, Louisville, Ky.—**The Operative Treatment of Gonorrheal Epididymitis,** Leigh F. Watson, Oklahoma City, Okla.—**Closure of Pylorus. Case Report with Suggestion as to Technic,** Richard A. Barr, Nashville, Tenn.—**The Neglect of Deformities in Children,** Charles S. Venable, San Antonio, Tex.—**Nerve Injuries Due to Bony Abnormalities,** Frederic M. Hanes, Richmond, Va.—**The X-Rays in the Diagnosis of Fracture from a Medico-Legal Standpoint,** A. L. Gray, Richmond, Va.—**Transplantation of the Anterior Temporal Artery,** J. Shelton Horsley, Richmond, Va.—**Soft Tumor of the Urinary Bladder,** E. G. Ballenger, and O. F. Elder, Atlanta, Ga.—**The Operative Reduction of Fractures Without the Use of Buried Retention Material,** Herman B. Gessner, New Orleans, La 521

RAILWAY SUURGERY.

Severe Crushing Injuries to the Knee Joint. W. F. Smith, Little Rock, Ark. 524

Treatment of Fracture of the Femur by Means of a Double Angular Plaster Splint. The Technic of Its Application and Advantages Claimed for It. J. H. Downey, Gainesville, Ga. 525

Discussed by E. C. Samuel, New Orleans, La., and T. H. Hancock, Atlanta, Ga.

EYE, EAR, NOSE AND THROAT.

Vascular Ligation in the Tonsillar Fossa. J. W. Jervey, Greenville, S. C. 528

Discussed by J. G. Murphy, Wilmington, N. C.; Lee Cohen, Baltimore, Md.; C. R. Dufour, Washington, D. C.; H. S. Hedges, Charlottesville, Va.; H. H. Martin, Savannah, Ga.; T. W. Moore, Huntington, W. Va.; and R. W. Bledsoe, Covington, Ky.

Intra-Nasal Obstructions. G. A. O'Connell, Birmingham, Ala. 531

AUTHORS' ABSTRACTS: Conservation of Vision, B. F. Matheny, Clarksburg, W. Va. 537

EDITORIALS 538

CORRESPONDENCE 547

BOOK REVIEWS 548

SOUTHERN MEDICAL NEWS 549

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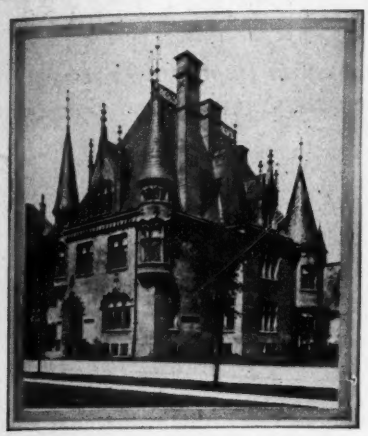

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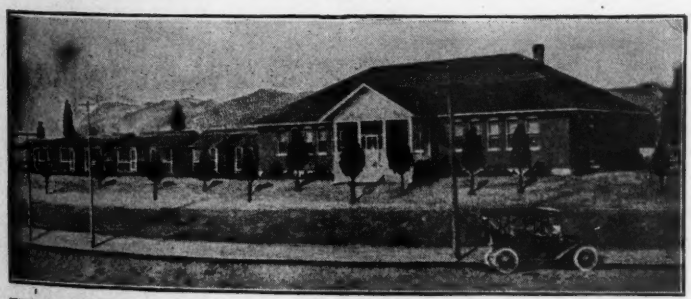

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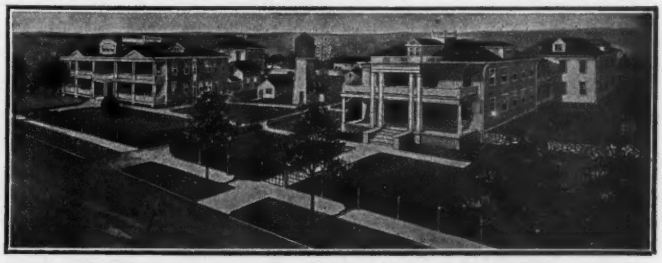

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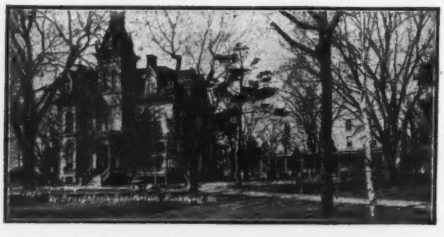

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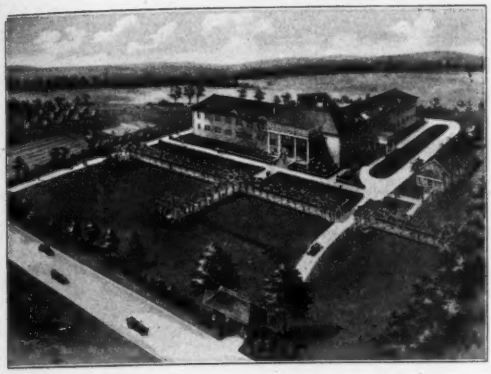

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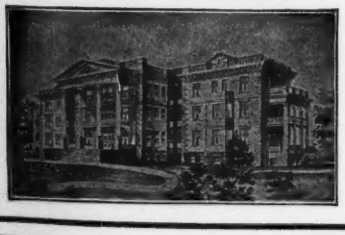

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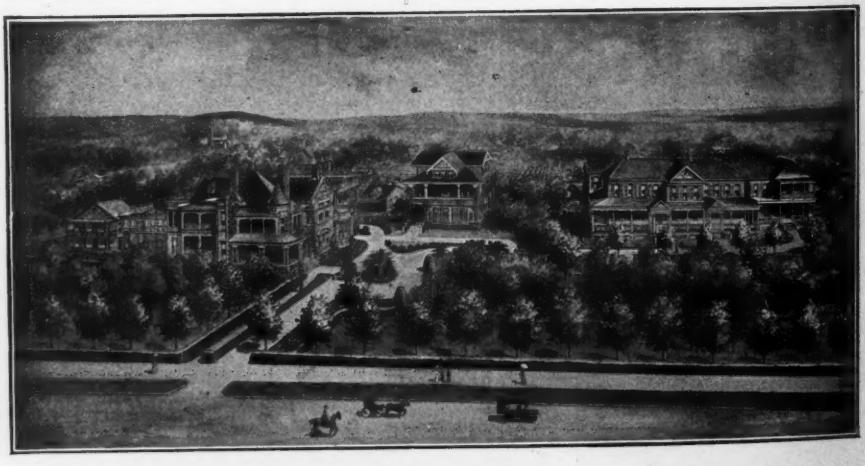

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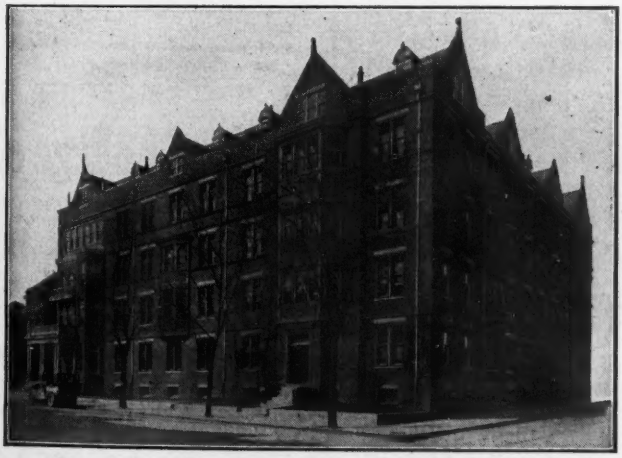

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Volume VIII JUNE 1, 1915 Number 6

MEDICINE

(INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.)

SYPHILIS OF THE HEART.*

By STEWART R. ROBERTS, M.Sc., M.D.,
Professor of Medicine, Atlanta Medical College, Atlanta, Ga.

This is an infection of the heart with the spirochetes of syphilis. The infection may produce endocarditis, valvular disease, aortitis, myocarditis, coronary vessel changes, angina, pericarditis, cardiac and aortic aneurism and heart block. The lesion produced is accompanied by its characteristic symptoms. The following cases illustrate the condition:

Case 1—A man 33 years old complained for six weeks of pain in the heart. At first exercise would cause pain, but now it exists all the time. He is nauseated when the pain is worst and often vomits. There is soreness in the abdomen and pain in the upper dorsal region. He often lifts his arms high over his head to relieve the sense of pressure in the chest. Lately there is a little dyspnea when not in bed and he sighs frequently. There is no cough, but swallowing is more difficult in the past week. During the last few days there have been several attacks of pain, coming on after eating and referred to the left shoulder and elbow. They last but a second and are followed by profuse perspiration and weakness. Pulse, 60, weak and regular; temperature, 97.6, and B. P., 95. Expression anxious. Precordium bulging, area of cardiac dullness greatly enlarged, cardio-hepatic angle obtuse. The heart sounds are very faint, and the aortic sound disappeared three days before death. Blood, H., 85 per cent; whites, 12,000; P. 38, S. L. 57, L. L. 4, T. 1, E. O. Urine negative. X-ray showed marked enlargement of heart and dilated ascending aorta. Syphilis denied. Wassermann highly positive. Death in a week. Postmortem showed a dilated heart and aorta, syphilitic aortitis, incompetent aortic and mitral valves, heart dilated, auricular walls thinned and parchment like, ventricles dilated, but walls thinner than normal. The coronary arteries were completely closed, and the heart received its blood supply through the vessels of Thesbesius.*

This man probably had acquired syphilis and yet never knew he had the disease. The syphilis remained latent probably for ten years, though the spirochetes had infested the aorta and were doing their deadly damage to the heart. He had angina of the first and second degree, and the remarkable closure of both coronary arteries.

Case 2—A young man 21 years was seen in January, 1913. He did office work. He complained of nervousness, weakness and of becoming exhausted quickly. His habits of life were exemplary; his weight 165; height, 6 feet 3 inches. His forehead and face were slightly asymmetrical. Heart slightly enlarged, apex in the fifth space,

*Read in Section on Medicine, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., Nov. 9-12, 1914.

*See F. H. Pratt, The American Journal Physiology, Vol. I, 1898. He shows that the vessels of Thesbesius may nournish the myocardium.

nipple line. There was a soft systolic murmur at the apex and a diastolic murmur in the aortic area. The aortic closing sound was split and accentuated and more marked than the mitral closure. Pulse was 64 and regular. B. P., 115-90-25. Lying on his left side was uncomfortable, because his heart felt "too heavy." The right epitrochlear gland was palpable; pupils ovoid, right the larger; knee jerks decreased, Romberg negative. The condition of the heart with no history of rheumatism or chorea, and with the other physical signs warranted a Wassermann. It was highly positive. He was given mercury, the iodides and salvarsan in gradually increasing doses. In a year and a half his blood pressure had risen to 140-80-60, his nervousness was less and his strength greater. The heart seems stronger, though the murmur persists. The blood and urine were negative throughout. This was apparently a case of congenital syphilis.

In this case one had to account for mitral and aortic murmurs in a man of 21, and the absence of all causes ordinarily considered. A syphilitic endocarditis had probably been present at some time in his life.

Case 3—A young woman of 28 years of age had never been strong. Her family history was negative, except that her father was a nervous wreck and had suffered paralysis at 52. She complained of heart attacks, gastric pains and leucorrhea. She had been curretted three times, and a cystic ovary resected. Bismuth meal and X-ray showed a puckered area in the region of her gastric pain. Her heart was normal in size. A blowing mitral lasting throughout systole was followed by a softer aortic second. The heart strained with a heaving beat. Occasionally there was a premature contraction and about once a month an attack of tachycardia with a pulse of 120, lasting from a few minutes to an hour. With the gastric pain and jumping heart would come indigestion, heartburn, and often nausea and vomiting. The Wassermann was highly positive. Under mercury, iodides and salvarsan the irregular heart, gastric pains and leucorrhea improved. This is a case of inherited syphilis, with probably a syphilitic gastric ulcer. The mitral murmur probably results from a syphilitic sclerosis of the mitral leaflets.

In a young woman whose environment was the best, and who had no previous history of any condition that could cause valvular disease, with gastric pains almost approaching the gastric crises of tabes in severity, and a strange condition of the generative organs, the heart lesions give the clue that clears the mystery.

The diagnosis of every case of heart disease should include the known or probable cause of the lesion. It is not enough to say that one has an aortitis, or a mitral lesion. There is a cause for every heart lesion, and the cause influences the treatment and the prognosis. The general causes of heart disease may be included in seven groups as follows:

1. Nervous states, producing functional disorders.
2. Congenital causes, producing congenital heart disease.
3. Rheumatic group—
   - (a) Tonsillar infections.
   - (b) Rheumatism. — Endocarditis.
   - (c) Chorea.
   - (d) Pneumonia. — Valvular disease.
   - (e) Gonorrhea.
   - (f) Septico-pyemias.
4. Intoxications.
   - (a) Alcohol.
   - (b) Gout. — Myocarditis.
   - (c) Lead. — Aortic disease.
   - (d) Diabetes. — Hypertrophy.
   - (e) Nephritis.
   - (f) Anemias.
5. Strain—
   - (a) Physical labor. — High pressure states.
   - (b) Mental tension. — Arterio-sclerosis.
   - (c) Sexual excesses. — Angina.
6. Syphilis. Congenital or acquired—
   - (a) Aortitis. Endocarditis.
   - (b) Valvular sclerosis.
   - (c) Myocarditis and heart block.
   - (d) Coronary sclerosis.
   - (e) Angina pectoris.
   - (f) Aneurism.
7. Senility—
   - (a) Coronary sclerosis and angina.
   - (b) Myocarditis.
   - (c) Aortic disease.
   - (d) Myocardial weakness, with or without angina.

The symptoms of heart disease caused by syphilis do not differ from the same disease produced by other causes. Syphilis is a common cause of heart disease. We probably

overlook more syphilis of the heart than we diagnose. Syphilitic aortitis produces about 75 per cent of cases of aortic incompetency in adults and about 80 per cent of aortic dilatation, aortic aneurism and angina. According to Longcope, the infection of the aorta and heart takes place during the second stage, and while occasionally the symptoms may develop within a year after infection, as a rule the process develops fifteen or eighteen years before the symptoms are prominent enough to call attention to the heart. These symptoms and signs include a positive Wassermann, dyspnea, a sense of compression in the chest, acute attacks of dyspnea and angina pectoris, valvular incompetency and a cardiac hypertrophy. The curvature of the nails may be increased and the nails cyanotic. Low blood pressure with an enlarged heart and arteriosclerosis is not rare. A chancre at 20 may at 40 give a transposed picture of advanced heart disease.

We have in recent literature Brooks' study of 50 syphilitic hearts, Warthin's 50 hearts of congenital syphilis, and 150 hearts of acquired syphilis; Mracek series of 150 cases; Hektoen and LeCount, 1 case each; Adler, 4 cases; Callender, 1 case; a total of 357 cases. This warrants the necessity for methodically considering syphilis as a common factor in heart disease. The following conclusions from these studies give briefly the pathology of the syphilitic heart.

1. The Spirochaeta Pallida can be demonstrated in the syphilitic heart. These spirochetes are abundant in the light staining patches of the myocardium. Large gummata are rare, but spirochetes are common in the heart in late syphilis.

2. The spirochetes in latent syphilis have an affinity for and a selective action upon the myocardium.

3. The spirochetes produce two forms of myocarditis: (a) Parenchymatous degeneration, characterized by the presence of spirochetes, chiefly around the blood vessels, in the intra-muscular spaces, but rarely in the muscle fibres. The spirochetes may appear in the heart muscle during the active secondary stages without recognizable lesions. As the years pass, in these spirochetes areas the muscle loses its color and striation, and the nuclei become pale or vacuolated. Other lesions are fatty degeneration, simple atrophy with or without interstitial increase, and small areas of necrosis; (b) Interstitial myocarditis. To the eye the heart wall may appear pale and wet, a white of egg appearance. These are areas of myxedema that appear like a simple edema. There is a perivascular proliferation and infiltration of endothelial and round cells, passing on to fibrosis. Many microscopical gummata in all stages of evolution are present towards the close.

4. Spirochetes are more numerous and more often found in the heart than in the liver.

5. Aenurism as a result of syphilitic infection and fibrosis may occur (a) in the heart wall, three cases out of fifty in Brooks' series; (b) in the sinuses of Valsalva, and (c) in the aorta. In two cases, aneurism of the aortic arch appeared in six months after the primary sore.

6. Syphilitic endocarditis often accompanies myocarditis, 74 per cent of Brooks' cases. Both aortic and mitral rings are involved more frequently than in the aortic alone. This may result in a typical murmur with stenosis of one or both orifices. Case 3 probably illustrates this type. A septic endocarditis may be grafted upon a syphilitic myocarditis, just as about 10 per cent of cases of chronic nephritis reveal at autopsy an acute exacerbation.

7. In arterio-sclerosis due to syphilis the coronary arteries show an advanced degree of sclerosis over the other vessels. The coronary changes include simple atheromatous patches, advanced sclerosis and inflammation of the terminal twiggs, endarteritis and closure of the coronary vessels as in case 1. Such involvement of the coronary vessels produces a progressive myocarditis and anginal attacks.

8. Patches of syphilitic pericarditis were present in 28 of Brooks' Cases. This is a

hyperplasia of a small area of the visceral pericardium, usually perforated by a terminal arteriole, but it is hardly to be diagnosed clinically.

9. Syphilis of the heart may produce therefore every organic lesion from a small patch of dry percarditis to an enormous aneurism.

The average time for the appearance of heart symptoms after infection ranges from 10 to 20 years, though it may appear in six months. A syphilitic myocarditis with an acute enteritis as the only presenting symptom may quickly kill an infant damned by ancestral infection. Heart disease in children with no history of the rheumatic group, points strongly to syphilis. I have seen recently one case of syphilitic endocarditis in a boy of 14, and a case of aortic incompetency in a girl of 12, in both of whom the radials were sclerotic and the Wassermann positive. A common clinical type is a patient between 35 and 50 who comes complaining of a "jumping heart" or premature contractions, attacks of dyspnea, angina of the first or second degree, sclerotic vessels, and blood pressure either high or low. If the myocardium is but little affected and the vessels sclerotic, the blood pressure is high; whereas the reverse obtains even with sclerotic vessels, if the myocarditis is far advanced. Syphilis produces a myocarditis just as senility and alcohol do, as typical a mitral as rheumatism, as typical an endocarditis as chorea, and as typical an aortic murmur as hard labor. Lewis ranks syphilis next to rheumatism as a cause of heart block and Stokes-Adams disease.

The treatment is simple and threefold: First, to remember that syphilis causes from one-tenth to one-third of all heart disease; second, that syphilis is treated by ordinary remedies, mercury, the iodides, and salvarsan. With this proviso, "Begin low, end high" (Erlich), I would not again give a patient with a syphilitic heart an initial maximum dose of salvarsan. Mercury and the iodides at first, and then small and gradually increasing doses of salvarsan until the Wassermann is negative. The murmurs and the myocarditis may not be entirely done away with, but the spirochetes can be killed and the advance of the lesions stopped. Thirdly, in reserve are the ordinary remedies for advanced lesions, digitalis, opium, and strophanthin, with diet and rest. After the use of the anti-syphilitic remedies the heart lesion is met on its merits by the rules of cardiac therapy, just as if it originated from rheumatism or any other cause.

(Discussion on page 472.)

CONCERNING SYPHILIS IN THE AMERICAN NEGRO.*

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In taking up the work to be herein reported there were a number of problems which we had in mind to investigate, chief among which were the much discussed and little truly investigated question of the prevalence of syphilis in our colored people; the possible relationship between this infection and the frequent high blood pressure in the people of this race; the apparent ravages of this disease in the negro, and the effects of this infection upon the birth rate and the survival of the offspring of syphilitic women, both intrauterine and postnatal.

The material here handled consists entirely of the type of negro who applies to our Southern dispensaries for treatment, and while this type may be called the lower class negro, it constitutes the greater percentage, at least of

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our Southern negroes, including day laborers, servants, and trades-people.

PREVALENCE OF SYPHILIS IN THE NEGRO.

Taking up first the question of the prevalence of syphilis in the negro, we find, as Hazen[1] has said, that "The subject of syphilis in the negro is one which has never been thoroughly studied and concerning which there are still many disputes, caused largely by prejudice and broad statements and the lack of careful investigation. Statistics on diseases in the negro are very meagre and on the subject of syphilis are almost entirely lacking." Among Southern practitioners one frequently hears the opinion that a very high percentage of negroes have this disease, the figures of 75 per cent, 80 per cent, 90 per cent, and even higher, having been used so commonly as to have been all but accepted as well based and conclusive.

According to Hazen[2] in the Washington hospitals, while the Wassermann reaction is not in routine use, statistics show about 30 per cent positive in the negro, and we are given to understand that at Johns Hopkins nearly 50 per cent of this race are positive. Then again, of 2,000 cases of skin disease under his personal observation, 440 were syphilitic, or 22 per cent, and in the Freedmen's Hospital, in the total tabulation of 90,172 negro patients from 1901 to 1912, 4,913, or 5.37 per cent, have a diagnosis of syphilis; these statistics, however, being made without the aid of specific tests.

Murrell[3] says, "In our dispensary work in Richmond we make the Wassermann test as a routine measure, and it is amost invariably positive. Of all the specimens of blood taken probably 75 per cent show a positive reaction."

Martin,[4] in Savannah, Ga., observes that 90 per cent of the negroes in his eye, ear, nose and throat work are syphilitic.

Having as his object a comparison between the amount of syphilis in the whites and negroes, Fox[5] collected statistics on 2,200 cases of skin diseases in each of whites and blacks, and 15,000 cases of general diseases in whites and 30,000 in blacks, and says, "To be exact, the blacks suffered 1.46 times as often as the whites."

This conclusion is borne out by Hyde,[6] Morison,[7] Dyer,[8] Matas,[9] Quillan,[10] Murrell,[11] Corson,[12] McHutten,[13] and Hazen.

Feeling that accurate statistics on this condition may not be had without verification by some specific test, and that possibly an injustice is being done by the recitation of opinions in which very high figures are used, we applied in routine fashion the Wassermann reaction to one hundred and two negroes who came to our medical dispensary at the Roper Hospital in Charleston during the spring of 1914 for treatment for various ailments, excluding only those who for some reason or other could not or would not submit to the test, and toward the last of the work using only women in order, for purposes of comparison to have an equal number of men and women.

These patients ranged in age from fourteen to sixty-eight years, the majority being in young adult life, six being under eighteen and five over fifty.

Of these one hundred and two cases fifty-eight gave positive reactions, and in three cases the reaction was doubtful.

While it may be claimed that this short series need not be a true criterion, we feel that in so far as the Wassermann reaction is trustworthy reliance may be placed in something near these figures, since the work was extended over a period of three months, taking consecutive cases two days a week for twelve weeks, and the percentage ran very steadily during that time.

These patients had not received treatment for the disease prior to the examination, and while a few cases have been followed and a therapeutic verification of the diagnosis obtained, we have been unable to make this part of the work complete.

It is interesting to note that, contrary to expectations, the women have a higher percent-

age of positive reactions than the men, 65 per cent against 53 per cent. While the significance of this higher rate in the women is not quite clear it serves to illustrate the results of the extremely immoral relationship between the sexes of this people, as is also borne out by the admission of sexual indulgence from practically all of the unmarried women.

We wish to merely mention, as a possible point in explanation, the retention of the products of sexual intercourse in the genital passages and consequently longer exposure to the infection.

Both Quillan and Murrell state that they have never examined a negro girl over eighteen years of age who was a virgin, and Hazen says the negro physicians of Washington admit that virginity is rare among the poorer members of their race.

Herein lies the reason for the high ratio of syphilitics in the colored race, and until some curb is placed upon this promiscuous sexual communication in this class of these people, or until proper therapeutic measures are forced upon them, syphilis will run rife among them and threaten those of us with whom they come in contact.

SYPHILIS AND ARTERIOSCLEROSIS.

Following up our next line of endeavor, it having been suggested to us through various channels that the so frequently observed arteriosclerosis and high blood pressure in the negro is closely related to syphilis, we instituted in the most of these same cases further examination to determine if any grounds may be had for such an opinion.

The reading was taken with the Faught apparatus by the auscultation method, and while, by reference to chart No. 1, it may be seen that the percentage of pressures above normal was considerable, we can see no such relationship between high pressure and positive Wassermann as to lead us to believe that arterial disease and high blood pressure is more the result, in the negro, of syphilis than of other conditions to which he is subject.

By reference to Chart No. 1 we see that of the nineteen men giving positive reactions in whom the blood pressure was taken nine gave high readings, or 47.4 per cent, while of the eighteen men giving negative reactions the same number, or 50 per cent, gave high readings; in other words, practically half of both syphilitics and non-syphilitics had high arterial pressures, and by further reference to the chart it may be seen that neither did the condition develop materially earlier in the positive cases than the negative, since the average age of the syphilitic was thirty-four and of the non-

CHART NO. 1.

Positive Wassermann Men.

Number	Average Age	Susp. Syphilis	History of Genital Sore	Blood Pressure Taken in	High in	%	Ave. Age	Normal in	Ave. Age	Chronic Cardiac Valve Lesions	%
27	31	18	8	19	9	47.4	34	10	25	3	15.8
Positive Wassermann Women.											
31	27	9	--	22	6	27.2	38	16	22	3	13.6
Positive Wassermann Total											
58	29	27	8	41	15	36.5	36	26	24	6	14.6
Negative Wassermann Women.											
16	29	1	--	10	2	20	29	8	30	1	10
Negative Wassermann Men.											
25	32	3	8	18	9	50	37	9	26	3	15
Negative Wassermann Total.											
41	30	4	8	28	11	39.2	33	17	29	4	14.2
Doubtful Wassermann Women.											
3	27	1	--	3	-------		3	27	--	--	--
Total.											
102	Positive	58		72	26	36.1	34	46	30	--	--

syphilitic thirty-seven, while the relationship between the average age of normal positive and normal negative is similar, being twenty-five against twenty-six.

In the women we see the same thing illustrated even more forcibly, for while many more women than men gave positive reactions, the occurrence of high blood pressure is only about one-half as frequent.

Neither here do we see any relationship between positive reaction and high pressure or the earlier development of it, since in the twenty-two positive women only six, or 27.2 per cent, gave high readings at an average of thirty-eight years, and of the ten negative women two, or 20 per cent, gave high read-

ings at an average age of thirty-nine years.

Rather, we see proof that arteriosclerosis and high blood pressure is the result of some condition in syphilitic and non-syphilitic alike, affecting more frequently the men and increasing in activity with age, since the average age in both sexes of those with normal pressures is considerably lower than of those with high pressures.

We have inserted here as merely suggestive, since the number of cases is not many, a comparison between chronic cardiac vulvular faults in the two groups, and it will be seen that while we had six of these conditions in positive cases against four in the negative, the percentage of occurrence is about equal in the two classes. On the other hand, in the women we see a larger actual and proportionate number of these lesions in the positive cases and, when it is remembered that these women suffered less frequently from arteriosclerosis than the men, we fail to reconcile the two suggestions and would leave this question for further investigation.

EFFECTS OF THE DISEASE.

In taking up the next phase of our work we are again confronted with a variety of opinions, published and unpublished. We hear on one side that the negro suffers more intensely the ravages of the disease than do the whites, or that he exhibits more severe manifestations of one chain of effects and less of another; and on the other hand we have heard frequently the opinion that the negro is developing a racial immunity to the infection and that he suffers little from its effects.

Here it may be well to say a word as to the symptoms which we found and their severity. Of the primary sore we heard nothing in the female, and in the men we learned enough to make us look with only mild suspicion on him who gave a history of a genital sore, for we obtained histories of such in sixteen cases, and half of these gave negative Wassermanns.

On the question of secondary skin eruptions we did not examine the surface of the body thoroughly, seeing only three or four cases of anything suspicious, and histories of such conditions were unobtainable.

Mucous patches, acute laryngitis, and acute pharyngitis were not infrequent.

Probably the most frequent and dependable sign was the bone and joint pain, or, as the negro expresses it, "misery" in his shoulders, chest, legs, hips, back, or head. This complaint was registered in seventeen of the positive men and eleven of the positive women, and was heard in the negative cases only when traceable to some definite condition, as "misery" in the back in lumbago, "misery" in the chest in acute bronchitis, "misery" all over the body in malaria, etc.

Of chronic leg ulcers we saw two; chronic arthritis, four cases; facial paralysis, one; of tabes and paresis, none; of gummata, one (probable) of the brain.

In other words, in these cases previous specific histories were almost negligible, symptoms, while well marked at times, were as frequently obscure, and the ravages of the disease were not as a rule severe.

Consequently we believe that in these cases a large per cent would have gone undiagnosed had all depended on clinical manifestations, and so statictics are likely to go askew when based on clinical diagnosis alone.

EFFECTS OF SYPHILIS ON FERTILITY OF THE WOMEN AND VIABILITY OF THEIR OFFSPRING.

Following up our last line of endeavor we believe we do, however, find a serious result of the disease on the fertility of the women and the viability of their offspring. This question was gone into very thoroughly in thirty-eight of the women, whom we class as those expected to have children, i. e., those who had been married from two to twenty-five years, or among the unmarried who admitted to similar exposure to impregnation and had had dead or live births.

By reference to Chart No. 2 it will be seen that of these thirty-eight women twenty-five gave positive reactions and thirteen were nega-

tive. Among those with positive Wassermanns three had had no births of any sort, neither had two of those with negative Wassermanns. Twelve with positive reactions had had miscarriages or stillbirths to the number of thirty-seven, and five of the negative women had had similar births to the number of eight.

Consequently about equal percentages of both positive and negative were sterile and about the same proportion of each had had miscarriages or stillbirths.

It is, however, in the number of miscarriages that we see the difference, thirty-seven in twelve positive women, more than three per women, against eight in five negative women; or even comparing to the total number of women in each instance we find that the positive averaged 1.48 miscarriages against .61 to each negative woman.

A similar story may be read by taking the individual case, for instance:

Case 22, married one year, one miscarriage; case, 20, married two years, one miscarriage; case 15, married two years, three miscarriages. case 13, married two years, two miscarriages; case 6, married two years, five miscarriages; case 12, married six years, five miscarriages; case 24, married six years, two miscarriages; case 7, married seven years, four miscarriages; case eight, married eleven years, three miscarriages; case 3, married twenty years, two miscarriages; case 11, married twenty-five years, eight miscarriages; and in the negative women: case 6, married eight years, one miscarriage; case 5, married twenty-three years, one miscarriage; case 13, married twenty-nine years, one miscarriage; case 1, married six years, two miscarriages; case 4, married six years, three miscarriages. It is worth mentioning here that this last case was suspected clinically of being syphilitic.

So it seems that, although a single abortion or miscarriage may occur no more frequently, the habit of miscarrying is much more prominent in the syphilitic than in the non-syphilitic.

According to Terry[14], during the four years from 1909 to 1912, stillbirths among the negroes in Jacksonville, Fla., constituted 13.8 per cent of all negro births, and it is interesting to note here that of all the births in these twenty-five positive women, 39 per cent were miscarriages or stillbirths. Of course, these figures cannot be compared because they have different meanings, and then our 39 per cent includes all miscarriages of the product of conception recognizable as such by these women, and we would take it to be low rather than high for this series, as very naturally early abortions were probably not recognized as such by them.

CHART NO. II.

WOMEN IN EXPECTANT CHILDBEARING CLASS.

I. Giving Positive Wassermann Reactions.

Number	Age	Married	Miscarriages & Still Births	Live Births	Now Dead	Av. Miscarriage	Av. Live Birth	Mortality Rate Among Child.	Mort. rate of all Conc. Offspr'g
1	25	6 yrs	--	--	--	--	--	--	--
2	25	5	--	--	--	--	--	--	--
3	43	20	2	13	9	--	--	--	--
4	39	15	--	2	1	--	--	--	--
5	42	19	--	1	--	--	--	--	--
6	21	2	5	1	--	--	--	--	--
7	28	7	4	--	--	--	--	--	--
8	32	11	3	1	--	--	--	--	--
9	18	1	--	1	--	--	--	--	--
10	42	20	--	15	--	--	--	--	--
11	70	25	8	--	--	--	--	--	--
12	25	6	5	2	--	--	--	--	--
13	22	2	2	--	--	--	--	--	--
14	28	9	--	3	--	--	--	--	--
15	23	2	3	--	--	--	--	--	--
16	22	4	--	1	--	--	--	--	--
17	70	45	--	9	9	--	--	--	--
18	20	2	--	--	--	--	--	--	--
19	20	4 mo	1	1	--	--	--	--	--
20	22	2	1	--	--	--	--	--	--
21	24	2	--	1	--	--	--	--	--
22	22	1	1	--	--	--	--	--	--
23	45	21	--	1	--	--	--	--	--
24	26	6	2	1	--	--	--	--	--
25	27	6	--	3	1	--	--	--	--
25	31	9	37	57	20	1.48	2.28	35%	60%

II. Giving Negative Wassermann Reactions.

1	25	6	2	4	--	--	--	--	--
2	24	5	--	--	--	--	--	--	--
3	45	22	--	5	5	--	--	--	--
4	25	6	3	3	--	--	--	--	--
5	40	23	1	5	--	--	--	--	--
6	26	8	1	2	--	--	--	--	--
7	25	4	--	2	2	--	--	--	--
8	24	7	--	--	--	--	--	--	--
9	33	16	--	2	--	--	--	--	--
10	25	5	--	2	--	--	--	--	--
11	19	2	--	1	--	--	--	--	--
12	38	18	--	6	3	--	--	--	--
13	50	29	1	11	--	--	--	--	--
13	30	11	8	43	10	.61	3.31	23%	35%

Then again, in regard to the probable effect on the living birth rate and the comparative equipment of these children for subsequent survival, we questioned these same women very carefully, and by reference to Chart No. 2 again we see the following significant features:

Of the twenty-five positive women, seventeen had borne live children to the number of fifty-seven, or 3.35 per woman, and of the thirteen negative women, eleven had had fifty-three live births, or practically four per woman, and taking an average for the total number of women in each class, the syphilitics had 2.28 live births per woman while the non-syphilitics had 3.31 per woman.

This is not as striking a difference as may be obtained by a further study of the chart when two exceptional cases are noticed, Case 3 with thirteen live births and Case 10 with fifteen live births. In other words, half of the children of this group were borne by two women, and eliminating them, there are only twenty-nine live births to twenty-three women, or little more than one per woman.

One may also gain similar information by a study of the data in each case, as for instance:

Case 4, married fifteen years, two live births; case 5, married nineteen years, one live birth; case 8 married eleven years, one live birth; case 11, married twenty-five years, one live birth; case 14, married nine years, three live births; case 23, married twenty-one years, one live birth; case 24, married six years, one live birth; and cases 1, 2, 7, 13, 15, 18 and 20, married, respectively, six, five, seven, two, two, two and two years, and none having living births; while in the case of the negative women one sees more reasonable figures, with the exception of the two sterile women previously mentioned, as: Case 1, married six years, four live births; case 3, married twenty-two years, five live births; case 4, married six years, three live births; case 5, married twenty-three years, five live births; case 6, married eight years, two live births; case 7, married four years, two live births; case 10, married five years, two live births; case 11, married two years, one live birth; case 12, married eighteen years, six live births, case 13, married twenty-nine years, eleven live births.

Following up the second phase of this question we found that of the fifty-seven live births in the positive women, thirty-seven were then living, giving a mortality rate of 35 per cent in these children, and again eliminating the exceptional woman with fifteen living children, a mortality rate of 62 per cent among the children of the syphilitic, while among the non-syphilitic, with thirty-three of the forty-three children then living, is a mortality rate of 23 per cent.

Finally we wish to draw a comparison between the total products of conception gone astray and the surviving children of each group. Taking in all of the women of each class we find in the positive ninety-four births of all types, dead and alive, and of these, thirty-seven were then alive, giving a total mortality rate, if it may be so called, of 60 per cent, against 35 per cent in the negative who totaled fifty-one births of all kinds and thirty-three then surviving.

To emphasiez these features we wish to call attention to the run of cases on Chart No. II as illustrative of these points interlocking.

Terry[14] asks why the mortality rate is so much higher (being 3987.5 against 1690.4 per 100,000 in fifteen large Southern cities and 2430.5 against 1478.2 in fifteen large Northern and Western cities) in the negro than in the white, and why it is higher in the Southern negro than in the Northern negro. He states that in Jacksonville, Fla., from 1908 to 1912, inclusive, the negro death rate was 23 per 1,000 against 14.9 in the whites, and the negro birth rate was 17.13 per 1,000, a loss of 5.7, against a gain in the whites of 3.5.

We consider that the information gained in this study claims a share in the answer to these questions and in the explanation of death rates excessive over birth rates in these people, and although this series of cases is not an exhaustive one, it seems to point steadily to certain conditions from which we draw the following conclusions.

CONCLUSIONS.

1. That in the Southern United States

syphilis in the negro is proven to be a serious problem, affecting probably from 50 to 60 per cent of the major class of this people, including day laborers, servants and trades people.

2. That the negro women are apparently more subject to the disease than the negro men.

3. That there is no apparent suggestive relationship between the positive Wassermann reaction and high blood pressure in the negro.

4. That the ravages of syphilis in the individual were not severe in this study, that the diagnosis of the disease is difficult to make in many of this class of cases without the aid of a specific test, and in respect to the Wassermann reaction, barring a few doubtful reactions and three or four negative reactions in suspicious cases, in our opinion this test proved of good value, verifying suspicions of the infection.

5. That it seems that while one or two miscarriages occur not more frequently in the syphilitic than in the non-syphilitic, the habit of miscarrying is much stronger in the former.

6. That syphilitic women are not as productive as the non-syphilitic, and their children do not survive as well as those of the latter.

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(Discussion on page 472.)

REPORT ON THE TREATMENT OF SOME TYPICAL CASES OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.*

By J. P. Munroe, M.D., *and* A. J. Crowell, M.D.,

It is not the purpose of this paper to enter into a detailed discussion of the treatment of syphilis in general.

It is not improper, however, to refer to the fact that there is no uniformity of action and practice among physicians, surgeons and specialists, some using salvarsan alone, others mercury alone, and still others a combination of the two treatments.

The speaker had an opportunity a little more than a year ago of observing the practice in several of the large hospitals of Europe. In Paris, in the largest hospital visited, neo-salvarsan was the medicine used and depended upon exclusively. In most of the German hospitals, and in Vienna, the ordinary salvarsan was used. In the London hospitals the prevailing custom was to use both salvarsan and mercury in varying proportions.

It is not meant that mercury was entirely neglected on the continent, but that it was given a very obscure place as compared with salvarsan. Indeed, Erlich himself, when asked a direct question by one of my visiting companions, in Frankfort, whether he would advise the exclusive use of salvarsan or a combination of it with mercury, replied rather modestly, "I would advise the use of both." When asked for an explanation as to why he would use anything in addition to salvarsan, answered promptly, "The big guns may not kill all of the enemy, so I would advise the use of small arms to reach those who may have escaped the effects of artillery."

The most complete statistics bearing on this subject at the International Medical Congress

*Read in Section on Medicine, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., November 9-12, 1914.

in London, August, 1913, were to be found in the reports compiled by the London hospital.

I will not copy the dry statistics contained in this report, but may refer briefly to its general outline and its record of average results.

There was a classification of several hundred cases. To one class was given salvarsan alone. To another, mercury alone. To a third, a combination of salvarsan and mercury treatment with salvarsan as the chief and predominant thing used. To the fourth class was given mercury and salvarsan, in this case mercury occupying the chief place.

In this last category, where mercury constituted the chief treatment, several courses of treatment were given at increasing intervals, and each course consisted of two doses of salvarsan and seven hypodermatic administrations of calomel. It is at least an interesting fact that this line of treatment showed better and more lasting results than any of the others referred to.

Several months ago, last February, to be exact, before a different society, the writer, in collaboration with Dr. A. J. Crowell presented a report on a series of cases treated by salvarsanized serum. In that report special emphasis was made upon salvarsan used in this way in the treatment of the degenerative diseases, especially paresis.

I shall not repeat what was said in that paper, nor discuss any of the cases except one, who was described as having taken only a limited number of treatments, not sufficient to hope for permanent results. It was not known at that time whether the patient would return for further treatment. He became the object of considerable interest in the discussion because his history was familiar to one of my most distinguished colleagues who was present. Indeed, the diagnosis had been made by this colleague, in the first instance, and he had unhesitatingly pronounced it a genuine case of paresis even before the Wassermann test had been made and proven positive. My colleague confirmed my diagnosis very emphatically, and with equal emphasis predicted that the future would show that the patient had experienced only one of the usual temporary improvements and that there would soon be a relapse and inevitable progress to a fatal termination.

With fear and trembling the writer has been waiting and looking lest this prediction come true. Up to this time the results are in our favor. In this paper he is designated:

Case I. Mr. L. Paresis. Blood Wassermann strongly positive. Spinal fluid Wassermann positive. Globulin reaction positive. Cell count 48, spinal fluid pressure 160 mm. Pupils small and sluggish. Three treatments of salvarsan were given, and in connection with two of them, salvarsan serum was injected into the spinal cavity. Mercury by inunction was used in the periods between the salvarsan treatment. As the result of these treatments all the reactions became negative and the cell count was reduced to 5. About two months later he returned, according to instructions, and although there were no returning symptoms, another dose of salvarsanized serum was used and mercury prescribed for a short course.

It is now a little more than one year since this patient first came under observation, and up to this time there have been no return of symptoms.

Case II—Mr. F. Paresis. First examined May 6th, 1914. Wassermann blood positive; spinal fluid positive; globulin positive; cell count 130; spinal fluid pressure 200 mm. He was given eight doses of salvarsan, in four instances salvarsanized serum, the treatment extending over a period of about eight weeks.

Mercury by inunction was also used while at hospital and prescribed to be used at regular intervals throughout the succeeding six months. At the end of two months' treatment, as described, all the mental and motor symptoms had been relieved, the blood and spinal fluid had become negative Wassermann and the cell count reduced to 9.

Up to this time there has been no return of symptoms.

Case III—Mr. G. Cerebral syphilis and optic atrophy and chronic arthitis of right knee. Wassermann positive for blood and spinal fluid; spinal cell count 25. Five doses of salvarsan were administered and salvarsanized serum used twice. Results: Both fluids became Wassermann negative; cell count reduced to 3; arthritis relieved

except for the resulting stiffness. No improvement to the eyesight.

Case IV—Mr. J. W. L. Cerebral syphilis with frequently recurring epiletform convulsions, usually light, but occasionally quite severe. Blood Wassermann positive; spinal fluid Wassermann positive; globulin positive; spinal fluid cell count 55; spinal fluid pressure 260 mm. Treatment of this case was commenced November 4, 1913, and has been followed with only partial success up to this time. His first course of treatment consisted of five doses of salvarsan, in two of which salvarsanized serum was used. During the intervals, and for considerable portion of the time since then, he has been kept upon mercury inunctions. Salvarsan was administered again in May and again in August. Since August he has been kept upon iodide of potassium in moderate doses about one-half of the time; during the other half mercury by inunctions has been used. The Wassermann test long ago became negative and the cell counts normal, but the clinical symptoms have never been absent long enough to justify the belief that he is entirely cured. He no longer has convulsions or severe headaches, but there come occasionally short periods of slight unconsciousness and dizziness, with other mild signs, indicating that he is not entirely well.

Case V—Mr. T. B. O. Syphilis of the spinal cord. (Diffuse myelitis affecting the cervical cord slightly, the dorsal cord chiefly.) Wassermann blood positive; Wassermann spinal fluid positive; spinal fluid pressure 260 mm.

Salvarsan used four times. In connection with last dose salvarsanized serum was administered. Under the ordinary use of salvarsan there was a constant improvement, but very slow. In the hope of hurrying matters, salvarsanized serum was used in connection with the last dose. Instead of hastening the cure, as had been hoped it would do, it caused such a serious relapse of symptoms as to undo, apparently, all the good that had already been done. I have never seen another case after spinal puncture, or the use of salvarsan serum, suffer as this young man did. For several hours he writhed in pain with high fever and wild delirium. After this his muscles wasted rapidly and the nerves of his legs in particular showed the reactions of degeneration.

It is interesting to note also that in spite of these frequent doses of salvarsan, a characteristic skin eruption persisted on the arms and body.

His parents were so discouraged that they took him home from the hospital as soon as he seemed able to bear the trip in an automobile. The forty-mile ride in the automobile caused another relapse accompanied with swelling of the joints resembling arthritis.

Fortunately they had not lost entire confidence in physicians, and after taking him home used, diligently, under my directions, mercurial inunctions. The results of this treatment gave me an agreeable surprise. There was a rapid disappearance of the eruption, which had yielded but little previously under the use of salvarsan. The paralysis also was disappearing rapidly and the muscles were gaining in volume and tone when last I saw him.

CONCLUSIONS.

1. Salvarsan seems to be indicated and proves beneficial in all forms of specific disease of the central nervous system.

2. Salvarsanized serum injected into the spinal cavity seems to add to the efficiency of the treatment in the degenerative types of the disease.

3. In inflammatory conditions of the cord it is risky, and perhaps unsafe, to use the salvarsanized serum injections.

4. Mercury adds to the efficiency of the treatment in most if not all cases. It is usually considered as secondary to salvarsan, but in some instances it causes the disappearance of conditions and symptoms that have proven resistant to salvarsan even though the latter was used persistently and in the most approved form.

(Discussion on page 472.)

THE TREATMENT OF SYPHILIS.*

By E. H. Martin, M.D.,
Hot Springs, Ark.

The treatment of syphilis has changed very much during the past four years.

Formerly we could not offer an absolute cure to any patient who came to us with syphilis in any stage. Today we can promise a cure to every patient who comes to us in any stage of syphilis, except when the cerebro-spinal system is affected, and then we

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can promise amelioration in most cases and a possible cure in some.

Of the millions of cases of syphilis treated thoroughly with mercury and the iodides there were not at any time a sufficient number of reinfections to warrant the idea of the absolute cure of syphilis by treatment, although a large majority of well treated cases remained in good health and begot healthy children. But as soon as we added salvarsan to the treatment reinfections began to occur, proving that these cases at least had been absolutely cured.

During the greater part of 1911 I merely added salvarsan to my routine treatment, using mercury by inunction or by injection and also pushing the iodides when symptoms were present, giving, in fact, what is now called the intensive combined treatment.

Very soon reinfections were reported from many sources and also occurred in my practice. Reinfections had been practically unknown to me before this. I had only seen two cases which seemed to be genuine. Diligent inquiry among the physicians of Hot Springs has brought to my notice only two other such cases before 1911. These cases may have been instances of recrudescence of tertiary cases becoming secondary, due to the breaking out of colonies from some unknown cause, but they seemed to me to be genuine reinfections following spontaneous cures, as none had had treatment for many years. Not a single case could I find who had had a reinfection following soon after even the most immoderate mercurial treatment.

Now, when reinfections began to occur after the combined treatment and to occur very soon thereafter, I could only judge that such cases had been absolutely cured. And knowing the absence of such reinfections early after the most severe mercurial treatment, I could give the credit for such absolute cures only to salvarsan.

So I gradually began to omit the mercury in the treatment of some cases and finally abandoned mercury and the iodides entirely and still had instances of reinfection.

During the past three years I have not used mercury in the treatment of any case of syphilis except by the request of either the patient or the home physician. The clinical and final serological results have been as good as that following the intensive combined treatment in the hands of others. In fact, I believe that a case of secondary lues, if properly treated with salvarsan, is cured before there is time for a marked mercurial impression to be made, so why use mercury?

Why does not the profession at large see this fact? To quote from a previous paper, "Because old ideas cling in the human mind; when railroads first came the cars were made as like stage coaches as possible; when automobiles came the old high-wheeled carriage and buggy were hard to get away from as ideal shapes, and many thousands were spent on such junk long after more practically shaped machines were obtainable. We never see such things advertised now. It took several years for the steam automobile to give up the ghost, even when gasoline cars were obviously more simple and dependable and efficient, but the agent who talked the superiority of the steamer to you a few years ago would not try to sell one now. So it may be that in time the profession will give up the use of mercury in the treatment of syphilis. I feel sure of it, but such change has not yet taken place."

In the light of my own experience I consider it as absurd to give mercury in addition to salvarsan to a case of syphilis as for an Indian hunter to shoot a bear full of arrows before killing it with a rifle.

Not only is mercury unnecessary, but we have the laboratory tests to show that it is never a victor, but only a peacemaker. After a vigorous course of mercury the formerly positive Wassermann becomes negative. The patient has been relieved of symptoms, although not cured, *i. e.*, the specific organism has been discouraged and forced to temporarily retire, but at the same time the fighting elements of the patient's blood have been put out of commission, the antibodies have been

inhibited and so we have a negative Wassermann.

How different the effect of salvarsan, which proceeds to actually destroy the specific organism and at the same time to encourage the fighting elements of the blood. This is so well known that the so-called provocative dose of salvarsan is of recognized diagnostic value.

The quiescent blood without any fight in it courses around the tertiary colonies, no antibodies present, Wassermann negative. Give only a half a dose of salvarsan and war is declared, in forty-eight hours in some cases antibodies are present and the Wassermann is positive. This fact alone should prove the superiority of the simple salvarsan treatment. After mercury or the intensive combined treatment the Wassermann is negative on account of the mercurial effect and remains so in some cases through a latent stage unless a provocative dose of salvarsan be given, *i. e.*, ordinary Wassermann is then valueless. But after a full course of salvarsan alone, even with the patient cured, the Wassermann remains positive until the antibodies gradually disappear; again the Wassermann is valueless to early determine a cure or as a guide to sufficient treatment.

How shall we then decide when an ordinary case of syphilis has had enough treatment?

Very simply, by the endotoxin reaction.

I have proven by numerous doses given to cured patients and to patients who have never had syphilis, that, apart from idiosyncrasy to the drug in a few cases, a dose of salvarsan has no physiological effect on the body temperature or intestinal elimination. Therefore, we must judge that the disturbance consistently observed after its administration in the treatment of syphilis are due to endotoxins released from the killed organisms causing the disease. The endotoxins of syphilis cause a rise of temperature or characteristic bowel movements, or both. As a rule if there are many bowel movements, there is not much rise in temperature and conversely. Nausea and emesis are probably drug effects and seem to be dependent on personal idiosyncrasy, but the change in temperature and the bowel movements are not drug effects and do not follow doses given to patients who have had sufficient treatment.

To quote from another previous paper of mine in regard to this endotoxin reaction: "Many have failed to note such reaction. I cannot understand why this is the case unless lack of care in making observations exists or unless mild reactions are overlooked. I have given many intravenous doses of salvarsan, have in fact made a good start on my fifth thousand, and the endotoxin reaction has not been absent in a dozen instances without good reason. One who sees a thing may be better able to judge its meaning than one who does not.

There are five possible disturbances after an intravenous dose of salvarsan and four of these should not occur and should be differentiated from the endotoxin reaction when they do occur. They are:

1. The true endotoxin reaction due to the liberation of toxin from killed micro-organisms. This differs in different stages of syphilis. It cannot begin until there are organisms killed, usually begins in about one and a half to two hours, and consists of a rise in temperature, often of only a fraction of a degree, but at times of several degrees, or one or more loose bowel movements, watery and gaseous, or of both. It subsides in from six to twelve hours unless there are protected colonies as in cerebro-spinal syphilis when it may be delayed or prolonged to the second day owing presumably to the slow breaking up of colonies. When gummata are present a secondary fever from absorption, usually a rise of one degree daily, may persist between the reactions from the weekly doses. The endotoxin reaction occurs after the concentrated solutions of neo-salvarsan, .9 gm. in 10 c.c., as well as when salvarsan is used in a larger solution, 250 c.c.

2. There may be a disturbance from extraneous toxins introduced with the salvarsan;

this, as is well known, is usually due to using old distilled water. It can be readily recognized, as it begins almost at once, always within thirty minutes after the dose has been administered. It does not occur if we use freshly distilled water and resterilize the salt solution.

3. A severe disturbance may occur, but fortunately it is rare, from disintegration of blood cells. This is characterized by one or more chills and a fever running at times to 103 or 104 degrees F., and lasting several days, and is in some cases followed by jaundice from free hemoglobin. This occurrence may be due to idiosyncrasy. It is also sometimes seen after intravenous doses of nitrate of silver and colloidal copper. But in some instances the cause may be the use of pure distilled water instead of salt solution in making the salvarsan solution. Pure distilled water alone will cause hemolysis if given intravenously in sufficient quantity, as reported by E. D. Krumbhaar in the *Journal of the A. M. A.* for March 28, 1914. I always use a four or five-tenths per cent solution of pure chloride of sodium, relying on the salvarsan and the hydroxide of soda to bring the chemical contents of the solution, when given, close to isotonicity and therefore obviating the danger of hemolysis. Physiologic saline solution should not be used, only pure chloride of sodium solution.

4. There may be a disturbance due to drug effect from oxidized or chemically changed salvarsan. This may be due, according to Wechselmann, to delayed elimination through the kidneys and comes on two or three days after the dose has been given. The salvarsan remains in the patient, becomes oxidized or otherwise changed and acts as a new poison. Wechselmann thinks this retention is due to the patient's being full of mercury, which weakens the kidney cells and prevents elimination. I cannot agree with this conclusion. The fact that it seldom occurs after the first dose, but usually after several doses have been given, would seem rather to indicate that kidney intolerance to salvarsan had become established. Fortunately it is rare. But if one uses neo-salvarsan, the oxidation may also occur through the carelessness of the operator or his assistants. Let neo-salvarsan be mixed in warm water or warm saline solution and then let some delay occur in the administration and the patient may be placed in danger. Frequently very little attention is paid to this caution to keep the 914 solution at about 70 degrees F., and the necessity of its prompt administration. This oxidation or chemical change in the salvarsan is reported to have caused death in some cases, but I have fortunately never witnessed such a result. In my experience it has merely caused a rash varying from what resembles an ordinary heat rash to a severe dermatitis followed by exfoliation of the epidermis. It is very annoying, but fortunately not of frequent occurrence.

5. There may occur a peculiar disturbance while the patient is on the table, a tendency to angio-neurotic oedema, which is at times alarming. This is strictly an idiosyncrasy increased by fright and at times accentuated by a full stomach. According to the *New York Medical Journal* for March 14, 1914, Galliot has reported in the *Paris Medical* for January 24, 1914, that a dose or two of adrenalin previously administered, either hypodermically or by the mouth, will prevent the occurrence of this oedema and redness in cases who have shown that tendency while taking earlier doses. This angio-neurotic oedema in more rare instances seems to affect the spinal nerves, causing intense pain in the back, which usually interrupts the administration of the dose. This pain does not occur in all cases of angio-neurotic oedema and may occur without the flushing of the face. Neither the oedema or the pain ever come on after the dose of salvarsan has been administered, but if at all, occur during the administration.

Emery, of Paris, reports supposed reactions due to contamination of distilled water from the glass parts of the still. He has found minute traces of lead and salts of silica in

such distilled water. This conclusion must be erroneous, as a febrile reaction necessarily comes from organic matter and cannot be caused by minute traces of inorganic chemicals.

Patients who are carrying a quiet crop of malarial organisms as so many of our Southern patients are, without having had a recent malarial paroxysm, will frequently have a second day fever, undoubtedly from the effect of salvarsan on the plasmodia. This occurs in my experience so consistently during the summer and fall, when a large majority of my patients are from the South, and so rarely during the winter and spring, when a majority of my patients are from the North, that I feel convinced of the correctness of this conclusion.

I have risked boring you by describing these different disturbances which may follow the intravenous use of salvarsan, not because the last four are of common occurrence, but to make the true endotoxin reaction more clearly understood and to show that it cannot be mistaken for any of the others or any one of them for it."

To successfully use this endotoxin reaction as a guide to treatment and its absence as an evidence of cure, one must study the reaction as it varies under different circumstances and during the different stages of the disease.

Syphilis has been divided into three stages; the primary stage is the first colony. As inhabitants mature in this colony and begin to voyage through the lymph and blood streams of the unwilling host the secondary stage commences, and when other colonies are formed in the tissues of the body we have the tertiary stage. These three stages are based not so much on the lapse of time as on the activity of the treponemata. The tertiary colonies may be active, producing visible effects, or may settle down into latency to remain inactive for many years. These three stages of first colonization, voyaging and recolonization may be sufficient for clinical division, but under the head of treatment must be classed as fourthly those tertiary colonies which have been formed in the inaccessible cerebro-spinal system.

The treatment of this disease in the first stage may be very disappointing to a patient who rushes to his physician and congratulates himself that he has come early and should, therefore, be most easily cured. The organisms in a chancre are protected to a certain extent from the blood stream by the condition of induration in this new colony and there also may be present spirochaete in some stage of development when they are not killable by salvarsan. In a few instances the induration of the chancre may disapear after one or two doses. The healing is generally prompt, but in many cases the induration at the site of the chancre persists after healing. The colony represented by this indurated spot continues to give off voyagers and the endotoxin reaction, while very slight, is positive. Very few cases beginning treatment early during the initial stage lose the endotoxin reaction until after five or more full intravenous doses of salvarsan have been given. By full doses I mean one decigram to each twenty-five pounds of the net weight of the patient. By net weight I mean the ordinary weight of the patient less from seven to ten pounds allowed for clothing and less an estimated allowance for fat in the obese. We are not intending to dose the patient, that is incidental, but we are drugging the disease-producing organisms. Our object is to make a salvarsan solution in the blood of the patient strong enough to kill the spirochaete. If one patient obviously contains twice as much blood as another, it will evidently take twice as much salvarsan to produce a 1 to 10,000 solution of salvarsan in his blood, and that is approximately what is necessary to obtain the best results. So a full dose of salvarsan for a primary or secondary case in an adult may vary from .4 gm. to 1. gm., although usually the commercial dose of .6 gm. will be accurate enough for all patients weighing from 140 to 170 pounds in ordinary clothing.

To return to our chancre case; the physician treating such a case and seeking to eradicate the disease has three courses to choose

from. He may excise the chancre and give salvarsan intravenously every week or ten days and then usually three or four doses will produce a cure. He may leave the chancre to ordinary local treatment and give the five to seven doses of salvarsan. Or he may give one or two doses to guard against the appearance of embarrassing secondaries and wait a month or two before resuming treatment, when usually the third or fourth dose of the next series will fail to produce even the slightest endotoxin reaction.

The question arises as to doubtful cases. Should a patient with typical chancroids be allowed to wait for secondaries or a positive Wassermann to prove the presence of a mixed infection before beginning the use of salvarsan. This may be left to the physician's judgment. The personality of the patient as well as his social condition would have great weight in making a decision. As a rule one will be safe in considering all venereal sores as either chancres or mixed and in guarding against the possible appearance of secondaries by at least one dose of salvarsan. If the Wassermann should be negative a month or two later, in such doubtful cases, no further treatment would be indicated. If positive, the weekly dose of salvarsan should be given until not the slightest endotoxin reaction follows.

The reason for giving salvarsan every week or ten days instead of at longer intervals is obvious when one considers that the shortest period of incubation in syphilis is about ten days. While one dose of salvarsan may, and has often, absolutely cured exceptionally favorable cases, it is not to be expected that all of the treponemata present are frequently in a killable stage of development at one time. To get those escaping as soon as they are old enough to kill and before they are old enough to multiply, the seven-day interval seems ideal. Intervals of a month or six weeks might permit some cases to continue indefinitely.

It is doubtful if the secondary stage of syphilis, during which all of the spirochaete are in the circulating blood or lymph, ever exists alone for any great length of time. It begins before the primary lesion has healed and cannot last long before the re-colonization takes place. So nearly all cases are either both primary and secondary or secondary and tertiary. I have seen the induration of the chancre still visible, a secondary eruption present and typical tertiary bone lesions beginning all at one time in the same patient. This is rare, but certainly the secondary stage cannot be measured in time.

However, the early tertiary colonies, if forming in accessible tissues are so active that they must be classed as secondaries for treatment.

The absolute cure of a majority of, but not all, cases of secondary syphilis may be accomplished by three intravenous doses of salvarsan. Some secondary cases have been fully sterilized of the treponemata by one dose, as proven later by genuine reinfections, many secondary cases are cured by two doses, but to be safe three doses should be given to all cases, and if the slightest endotoxin reaction occurs after the third dose, the weekly doses should be continued until it is lacking. The fact that more than three doses is frequently necessary in secondary syphilis can be explained by the probable existence of tertiary colonies which have given no symptoms.

The treatment of tertiary syphilis is the same as that of the secondary stage, except that here we have to repeat the doses until all of the colonies are broken up and killed. Usually from five to seven doses suffice (the endotoxin reaction still being the guide) except in cases of cerebro-spinal lues, which will be considered later.

Some cases of bone syphilis require more treatment and a very few cases of old tertiary ulceration of the skin are peculiarly intractable. I am still treating a patient of this kind who has been given twenty-seven (27) doses of salvarsan, and each dose is still followed by an endotoxin reaction. These doses were not all given at weekly intervals, but at least half of them were given at intervals of ten days or less, once three weeks and twice four weeks elapsed between doses. The obsti-

nacy of his case to treatment is due to the peculiar conditions present. He had many old tertiary ulcers on his arms and legs. The latter had made scar tissue, which had re-ulcerated repeatedly, of nearly all of the skin from his knees to his ankles. When first seen by me both of his legs were masses of ulcerating tissue. This condition had for eight years resisted the most heroic treatment with mercury and the iodides that Hot Springs can offer. It would appear that so much normal tissue had been destroyed and so much scar tissue has taken its place that a cirrhosis of the skin exists. While always inflamed, the scar-skin has really a very poor blood supply and colonies of spirochaete remain more or less protcted and it is hard to kill all at the same time. For nearly two months recently he had been entirely well clinically, but two small spots began to break down after a three-weeks' interval between his seventeenth and eighteenth doses. Since then there has been further improvement in this case and I feel sure that a few more doses if given at weekly intervals will eradicate the disease and abolish the endotoxin reaction.

Such persistency in treatment is not often required in ordinary tertiary cases, but whenever the treatment of a case is begun it should be continued until the case is cured. Inadequate courses of treatment with long intervals between will result in accidental cures occasionally, but the patient is apt to be in the same condition at the beginning of each course of doses if the interval is long.

The treatment of the fourth class of cases, tertiary infection of the cerebro-spinal system, does not differ from that of other cases of syphilis except as to the greater persistency required. The colonies being more or less inaccessible to the blood stream, cannot be broken up promptly.

But the blood nourishes every cell in the body. Even the nerve cells receive material from the blood indirectly in some way and the influence of the salvarsan is felt by the colonies in brain or cord, not enough usually to cause an endotoxin reaction during the first twelve to twenty-four hours, but enough to produce a consistent second day reaction not seen in other classes of cases. It seems as though the salvarsan influence causes a disturbance in the protected colonies and an entrance of some of the treponemata into the blood stream gradually and a mild second-day reaction is the result.

Persistent intravenous medication will certainly give satisfactory clinical results in cerebro-spinal lues, tabes and paresis. From ten to twenty doses will be required and in some cases more may be necessary, but improvement is often seen after the first few treatments. In cases of cerebral gummata great patience may be called for, as even a subcutaneous gumma will take a long course of treatment before absorption is complete.

The final results and the degree of restoration to health will depend upon the extent of damge done by the disease to nerve or brain tissue before treatment is instituted. Nothing anatomical can be restored nor can scar tissue be removed. But in tabes, for instance, many of the most distressing symptoms are evidently caused not by the sclerosis in the cord, but by the area of inflammation around the sclerotic area in progressive cases. Some symptoms will disappear, the progress of the disease will be stopped and the life of the patient will be prolonged and made more comfortable.

We should not offer any promise of results to any cerebro-spinal case, but a hope that the progress of the disease will be stopped and that some improvement in the symptoms may take place. Also we can promise that much but no more to cases of partial optic atrophy while those suffering from inflammatory deep eye troubles will get better results.

Full doses should not be given to cerebro-spinal cases, usually about two-thirds of the dose for weight is better. These patients have more frequent idiosyncrasies and show more drug effect than others. And in many cases irritation of the nerve center which happens to be affected by the disease may cause an increase of unexpected and unpleasant symptoms, such as cerebral vomiting, which may

be rather persistent at times. Even when the treatment is well borne the fact that from ten to twenty doses are to be given gives reason for using smaller doses than usual.

The endotoxin reaction fails us late in these cases and cannot be depended on to be present after but a few colonies remain. Clinical symptoms and laboratory findings have to guide us, and even with these we can only guess when a cerebro-spinal case has enough treatment.

I have had no experience with the intraspinous use of salvarsanized blood serum or the use of minute doses of salvarsan by lumbar puncture. The best results reported from the Swift-Ellis method are no better than those I obtain from persistent intravenous treatment alone, and I am inclined to believe that the good results so reported should be credited altogether to the intravenous doses preceding the intraspinous doses and not to the latter at all. Certainly the results reported in various series treated only with the serum prepared from other patients do not compare with those from cases who have had the intravenous doses also.

Obtaining just as good results from the intravenous method, I have not felt justified in using a treatment more difficult and dangerous and which at the same time strikes me as being quite illogical for these reasons:

First, the claim that drugs cannot reach the nerve centers because no vessels cross the subarachnoid space does not accord with the sensations felt after taking a quantity of alcohol, for instance. The brain centers certainly are reached by a dose of morphia and the spinal centers by strychnia. Second, what advantage can it be to introduce salvarsan into the sub-arachnoid space if the germ colony is within the nerve tissue or brain tissue? It is only placed nearer by contiguity, not by continuity or through reaching a more accessible circulation. Third, the largest amount of salvarsan that can be expected to reach the cerebro-spinal fluid is only two milligrams and the circulation of the fluid very uncertain. Should complete diffusion of the salvarsan take place within even six hours' absorption would already have greatly reduced the amount present. Experience with spinal anesthesia shows that the diffusion of drugs in the cerebro-spinal fluid is very slow and their loss by absorption comparatively rapid. Estimating the total amount of spinal fluid at from 80 c c. in some patients to 200 c.c. in others, and the diffused salvarsan remaining in solution as from one-half to one milligram, the probable strength of the solution can be considered at from 1 to 80,000 as the strongest estimate and a possible dilution of 1 to 400,000. The latter strength is more probable and represents the strength of a .6 gm. dose dissolved in sixty gallons, or an extra large barrel, of salt solution. Hardly an effective strength.

Just one word as to laboratory helps in the treatment of syphilis; they are invaluable when really neded. They are needed more often than used by the general practitioner and used more often than needed by the specialist. The number of spinal punctures made on some patients indicates that their doctors are more gifted with scientific curiosity than they themselves are with friends. The number of Wassermann tests made which are foreknown to be positive shows a curiosity that is meddlesome, and worse if the patient has to pay for them. We knew syphilis long before we knew blood tests, and when the clincal diagnosis is plain we need no blood test. Tabes is usually of easy recognition, and I consider a spinal puncture unwarranted when there is no doubt of the diagnosis. The Wassermann test is so usually negative in latent cases that are truly syphilitic and so consistently positive for a time after salvarsan cures and the diagnosis is so easy clinically in most other cases, that, while it has uses and is distinctly helpful under certain circumstances of doubtful diagnosis in cases of distinctly active disease of some sort, I do not think it is as important as the space given it in the medical press would imply. Except in unusual cases, such as that just mentioned, I can see no necessity or use for the Wassermann test during the treatment of a case. But I do think that Wassermann tests should be made in every case two months

and six months after the loss of endotoxin reaction indicates that the treatment has been completed and a cure accomplished. Such post-treatment tests eliminate error, verify results and by reassuring the patient tend to prevent future attacks of syphilophobia.

(Discussion on page 472.)

THE ETIOLOGY AND TREATMENT OF TABES DORSALIS AND SPECIFIC PARESIS.*

By Estill D. Holland, M.D.,
Hot Springs, Ark.

Gentlemen, the medical journals have been full of the treatment of tabes dorsalis and specific paresis for the last year. And I want to say at the beginning of this paper that I agree with the supporters of the Swift-Ellis treatment under certain conditions, the conditions being when other methods fail.

If the intraspinal injection of salvarsan was followed by uniformly good results or even by a larger proportion of good results than other methods of giving salvarsan for these troubles, I would be heartily in favor of its adoption as a routine measure in spite of the fact that it has a good many drawbacks of technic that would necessarily limit it to the hands of the few, and also in spite of the fact that the real and psychological shock, to say nothing of the pain, is quite a trial to an individual whose resistance and poise is already far below par.

I would like to quote from a paper appearing in the *A. M. A. Journal* of October 10, 1914, which was entitled "Paresis Patients Treated with Intraspinal Injections of Salvarsanized Serum," and was read before the section on "Nervous and Mental Diseases" at the last meeting of the A. M. A., in which the author reports the treatment of thirteen patients in this manner, of whom six showed improvement in some manner "not necessarily clinical," five are dead and two are no better.

The only doubtful part of this report is what may be meant by six improved "not necessarily clinically." Does that mean that the physician may count the cells and estimate the protein of the spinal fluid and know that the patient is five cells better to the c.c.? Or can he find that the Wassermann is only one plus instead of two plus? Is paresis such an acutely fatal disease that nearly half of all paretics die in one year after the beginning of treatment?

Gentlemen, there is only one test for a therapeutic agent, and that is: does it improve the patient; does it overcome or help to overcome the disease? A paretic whose improvement has to be determind with a microscope is still a paretic, and any therapeutic agent which makes an acute fatal disease out of a chronic gradual collapse is not suitable for general use.

I had the good fortune to be one of the first physicians in this country to report the treatment of tabes dorsalis and paresis with salvarsan, having reported five cases of tabes and one of paresis in the *Monthly Cyclopedia and Medical Bulletin,* of Philadelphia, February, 1912, all of the cases having been treated the year previous.

Satisfied in my own mind that all tabes and most paresis was due to syphilis and due to the same kind of syphilis that causes a chancre or a mucous patch, I saw no reason why the remedy par excellence for the other manifestations of syphilis, should not be good for syphilis of the nervous system.

Fortunately having a hopeless case of paresis on hand at the time, who had resisted all other treatment, I was able to put my theory into actual practice by giving him a full dose of salvarsan on February 17, 1911, less than six weeks from the time that salvarsan had reached Hot Springs.

I want to report these cases in brief, as they all now represent conditions after over three years, and I am sure that you all heard the dire predictions of what would happen to all these supposedly poor victims of medical mod-

*Read in Section on Medicine, Southern Medical Association. Eighth Annual Meeting, Richmond, Va., November 9-12, 1914.

ernism and extremism which were so freely made about 1911 and 1912.

Not wishing to take up any more of your time than is necessary to present the facts, I am going to make the case records as brief as possible.

Case 1—Mr. W., age 43. Had chancre, 1899; took treatment for several months, and had no more trouble until he had a paralytic stroke in December, 1909, from which he was confined to bed for several weeks. Came to Hot Springs in February, 1910, exhibiting all the symptoms of the maniacal stage of general paresis. We immediately put him on the mixed treatment, giving the mercury by inunctions and injections. Patient was soon able to walk and could talk thickly, but was extremely nervous; he would cry at the slightest provocation and would fly into a tantrum from the most trivial cause, or from no cause at all. He talked very indistinctly and would get so excited upon trying to carry on a conversation that he would lose all control of himself, and either cry or become angry. Patient had a crisis at least once a day, during which he would attempt to injure himself by bumping his head against the wall or a door, and the presence of any member of his family would only aggravate the condition.

Patient remained at Hot Springs for six months the first time, and although his general health improved, the tantrums continued. He stayed at home a few weeks during the summer of 1910, and returned to Hot Springs that fall in about the same condition as when he left. We started him at once on mixed treatment again and, by keeping him saturated, could keep the disease from progressing, but could make no appreciable impression on the existing symptoms. He still had his tantrums every day, and sometimes oftener than once a day; if he could not get to sleep for ten or fifteen minutes after going to bed he would get nervous and have one of his spells. Hypnotics were required every night. On February 17, 1911, I gave him a full dose of salvarsan. He had a restless night following the injection of salvarsan, but did not have another crisis after the injection.

His nervousness gradually became less, and by March, the 25th, 1911, he was able to walk without a cane, carry on a conversation without losing control of himself, and lie in bed at night for two or three hours without getting nervous.

This patient continued to improve until he was able to resume his business in August, 1911. He seemed to be quite normal mentally and showed a well-established co-ordination. He was attending to business when last heard from in 1913, and reported to be well by his brother. Certainly no mental abnormality as he is a wealthy man at the head of a large business.

Case 2—Mr. J., age 32. Contracted syphilis 1904, for which he was treated about six months. In the fall of 1910 he noticed an unsteadiness in his gait that was soon noticed by railroad officials, causing him to lose his position as engineer on one of the big roads.

Patient was first seen on May 20th, 1911, when he presented all the symptoms of tabes dorsalis in a well advanced form. He walked with a cane and watched his feet constantly while doing so. I gave him a dose of salvarsan on May 23, 1911, after which I gave him vapor baths for a week and allowed him to return home, as he could stay no longer. Patient wrote me frequently that he was better, and on the first of September he had a Noguchi test made which was negative. He said that he was walking without a cane and could read without his glasses, seemed to have no more trouble walking in the dark than he had ever had, and had passed an examination as railroad engineer and was working for another road. I realize that some railroad examinations are very lax, but this man must have improved a good deal to have escaped the notice of the most careless observer. Of course this man was not well, but he was able to work, knew that he was better and felt encouraged. I heard from him during 1912, saying that he was working and had taken two more doses of salvarsan.

Case 3—Mr. C., age 40. Contracted syphilis during 1906. Had a stroke of paralysis two years ago and was confined to bed for three weks. Came to Hot Springs in the fall of 1910, and began a vigorous mixed treatment, which he continued without any marked results until June, when I first saw him.

Patient was very ataxic; he walked with a cane with difficulty. All the symptoms of tabes present to a marked degree. He had incontinence of urine and a chronic constipation which required the use of drastic purgatives. I gave him a full dose of salvarsan on June the 2nd, 1911. Patient began to improve almost imediately, and by June the 10th he had discarded the rubber sheet, that he had slept on for nearly a year, as he could control his urine long enough to get to a urinal. He continued to improve until by the first of July he would walk very well without his cane. I gave this patient a second injection of salvarsan on July the 10th. Patient left Hot Springs during October, 1911, having gained eighteen pounds, walking without a cane, reading for long periods

at a time without any special effort, and with his constipation greatly relieved.

I heard from this patient in December, when he stated that he was continuing to improve, was able to take long walks, slept perfectly and was entirely refreshed in the morning.

I heard from this man again during the summer of 1913, and he stated that he was again working as a typesetter in California, and felt well though his bladder still bothered him some.

Case 4—Mr. S., age 51. He had syphilis for over twenty years. Ten years ago had difficulty walking in the dark. Was examined and told he had tabes. Came to Hot Springs to take treatment at that time. Patient followed treatment very irregularly and became constantly worse. I examined him first in the spring of 1911, and found all the symptoms of tabes. Patient had been having shooting pains for several years, but they were becoming more frequent, until during August and September, 1911, they were almost constant, with crises coming on two or three times a month, which required morphine in large doses to control.

Patient was run down, very weak and anemic. He was constipated, had girdle pains and in fact all the classical symptoms of tabes. October the 25th, 1911, I gave patient a full dose of salvarsan, as he had tried everything else and was getting worse so rapidly that something had to be done, and there was no time to build up his general condition.

Every ache and pain that he had ever had seemed to revive, and although he was able to attend to his business after three days, he was very miserable and continued so for two weeks, when he had another crisis which required the use of morphine. By December the 1st, 1911, patient was looking better, had gained five pounds, was free from pains and had a fine appetite with no trouble from constipation. January 12th, 1912, patient was back to his normal weight, had not had a crisis in over two months, and no longer had any shooting pains.

Patient began to drink very heavily, and in September, 1913, he began having pains badly enough to necessitate hypodermics of morphine again. I gave him another full dose of salvarsan during October, 1913, and he has not had to have morphine since, and is attending to business every day and taking somewhere between four and forty drinks a day. He says he is in better condition than he has been in for ten years and he looks it.

Case 5—Mr. M. No history of syphilis. Began having trouble walking several months ago; also noticed that his eyes did not respond when he stepped out of the house at night.

Patient arrived in Hot Springs the latter part of December, 1911, and had a Wassermann test made, which proved slightly positive. Patient came to see me December the 28th, 1911, and finding all the symptoms of tabes and no contraindications, I gave him a full dose of salvarsan December the 30th. On January 1st, 1912, patient said that he no longer had such dizzy feelings and that his eyes felt much stronger. By January the 12th he could walk with a firm step, did not even carry a cane, had gained six pounds, slept and ate well, and on the whole felt like a new man.

This patient was a surprise to us, as we had told him that he would not notice much improvement for a month or so no matter how well the treatment worked on him, and we can only explain his sudden recovery on the supposition that, instead of being destroyed, the nerve tracts were only inflamed and that as soon as the etiological factor of their inflammation was removed, by the salvarsan, the inflammation subsided and the nerves resumed their function.

I heard from this patient a few weeks ago and he reported himself as feeling fine. He has been on a trip over Europe for the steel trust since his visit to Hot Springs and is actively engaged in business, holding a responsible position. He has taken several doses of salvarsan since leaving Hot Springs.

Case 6—Thirty-four years old. Had been coming to Hot Springs every year for several years for tabes dorsalis. He had very severe crises, and I had often had to give him several hypodermics of morphine a day for several days at a time for the pains, which made him cry out and were unbearable. He walked with two canes, and then very poorly. Patient took his first injection of salvarsan on the 13th day of January, 1912, and said at the end of a month that he had more feeling in his feet, could walk two miles a day, and get up perfectly refreshed in the morning.

Patient returned to Hot Springs in January, 1913, and took two more doses of salvarsan with the mercurial inunctions between. He has not had a shooting pain in nearly two years now, walks without a cane, and to the ordinary observer is a well man.

I wish to report one more case of paresis that I treated in 1913:

Mr. W., age 33. Rural mail carrier. Patient had had syphilis some eight years previous and

had taken some patent medicine from some advertising firm in Kansas City. About November, 1912, began to notice that he was unsteady on his feet, was apt to fall when getting in and out of his buggy, had trouble in enunciating and forgot what he was saying. His father brought him to Hot Springs on April the 5th, 1913, when he presented all the typical symptoms of paresis advanced to where he was idiotic in conversation, and his speech so slurred that one could hardly understand what he said. He could hardly stand up without a cane, and could not be taught to use one, so that his father had to constantly hold him by the arm while walking. He had incontinence of urine and could not get out of bed by himself without falling. I thought that he was hopeless, but after having gotten a two plus Wassermann I gave him a full dose of salvarsan on April the 11th, 1913, and another on April the 22nd, with the mercury in between and large doses of the iodides.

Mr. W. left Hot Springs May the 5th somewhat improved and able to get around a good deal better by himself, but by no means mentally or physically well. I did not see him any more until May, 1914, when he walked into my office without a cane and introduced me to his aunt, whom he had brought to Hot Springs for treatment. He had come because she was old and afraid to travel alone. He talked well, walked well and without a physical examination it would have been hard to tell that he had ever had paresis. I had a Wassermann made on Mr. W. during his stay and it showed negative.

Gentlemen, I could cite you over a hundred such cases that I have treated in the last four years with only five cases that failed to improve under such treatment, and with no deaths, and that is the reason that I think the intraspinal treatment with its added danger and shock should be used only when other methods fail.

I have been very anxious to use the Swift-Ellis treatment and have been prepared to give it ever since I attended the last meeting of this society, but as yet I have not found a case in which it was necessary.

I would like to say in conclusion that I think the Wassermann test, the way it is interpreted by the average physician, is the most dangerous thing we encounter in the treatment of paretics and tabetics today. I have patients come to me all the time satisfied that they are not syphilitic, because they have had a negative Wassermann test made somewhere. The only service that a Wassermann test can render a physician in the treatment of these nervous syphilitic conditions is as a means of making a prognosis—the stronger the Wassermann the betetr the prognosis; but I do not pay any more attention to a negative Wassermann in the sense of excluding syphilis, than if I had never had it made.

I think that all tabes dorsalis and most paresis is due to exactly the same germ as is the chancre and the eruption of syphilis, and if any one will take the trouble to take a complete history of a hundred cases of tabes and most paresis the only thing that he will find common to them all is the fact that they did not have very much trouble controlling their primary and secondary stages of the disease and consequently did not take sufficient treatment over a sufficient length of time. The luckiest syphilitic is the one who got a sore throat every time he smoked a cigar for five years after contracting his disease, as he had to take treatment, and you will not find any of that kind with tabes or paresis.

I know that these cases do not agree with the general experience of physicians in the treatment of these conditions with the intravenous injection of salvarsan, and all that I can say is that the first six cases are given just as they came, that every case reported was a typical case of its kind, was seen by at least one other physician (Dr. T. E. Holland) before treatment was begun, and a great many of my cases were seen by several physicians. Case No. 4 is known to half the physicians in Hot Springs. All of the above cases are reported as correctly as my honest observation would allow.

I claim and want no special distinction for treating tabes and paresis in this way, but I do want to impress on you gentlemen that these conditions are amenable to such treatment no matter what results some other physicians may have had.

(Discussion on page 472.)

ATYPICAL NEUROLOGICAL SYPHILIS.*

By Beverley R. Tucker, M.D.,
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By atypical neurological syphilis is meant syphilis which manifests itself in affecting nervous tissue so that the symptoms are not expressed in the usual manner seen in the well-known diseases of tabes and other familiar chronic cord conditions, acute cerebro-spinal conditions and paresis. In the unusual manifestations, neurological syphilis may simulate nervous diseases which are, as a rule, non-specific in origin, and it is obvious that it is highly important to recognize the specific nature of the condition when it exists. In this paper a few of these manifestations which have come under the writer's observation will be mentioned and briefly discussed.

In making our diagnosis of a neurological syphilitic condition, the Wassermann test, the luetin reaction and the examination of the cerebro-spinal fluid have greatly aided us in recent years, and the intensive use of salvarsan, in addition to mercury and iodide, has made treatment more effective.

Atypical neurological syphilis has in some of our cases affected the peripheral nerves and presented the clinical picture of Bell's palsy, trifacial neuralgia and sciatica.

Six years ago, in the dispensary of the Medical College of Virginia, a colored woman, age 27 years, presented herself with typical Bell's palsy of several months' standing. The condition had failed to yield to the usual treatment. After an acknowledgement of syphilitic infection, she was put on mercury and iodide, and the facial paralysis promptly disappeared.

Two more cases have since come under observation, who gave positive syphilitic findings, and in these the paralysis of the seventh nerve quickly yielded to anti-specific treatment.

In the same manner, a case who came with an ordinary clinical type of trifacial neuralgia cleared up on anti-specific treatment after the usual medical methods of relief had failed.

A case of sciatica, typical in all its manifestations and severe in type, was entered at the Memorial Hospital in 1911, and failed to yield to the usual treatment. The patient, although a married man with several healthy children, admitted a specific infection seven years before. He had taken anti-rheumatic and anti-malarial treatment without avail. Mercury and iodide treatment was instituted, and he was well in three weeks. In none of these cases was there other clinical evidence of nerve tissue involvement.

Considering another group, some cases of atrophy and apparent pseudo-hypertrophy give positive Wassermann reactions. Burr has called attention to the presence of the positive Wassermann in cases of progressive muscular atrophy.

A patient came under observation with the symptoms of progressive muscular atrophy on January 13, 1913, and became gradually worse until July, 1914, when a positive Wassermann was obtained. He was given five intravenous injections of salvarsan and one intra-spinal injection by the Swift and Ellis method, and an arrest of the disease is hoped for.

In February, 1909, a girl of fifteen came under observation, who presented the clinical picture and symptoms of pseudo-muscular hypertrophy. She had, however, Hutchinson's teeth and absent knee jerks. She was put on mixed treatment for many months and greatly improved.

Neurological syphilis has also been expressed in cases resembling so-called idiopathic epilepsy, migraine and Meniere's disease. Epileptic attacks may be the manifestations of either congenital or acquired syphilis. Several cases of congenital syphilis with Hutchinson's teeth and other syphilitic stigmata have been brought as cases of so-called idiopathic epilepsy. They usually had taken bromides, but it was found that they improved more on antiluetic treatment. Cases of acquired syphilis frequently have epileptoid attacks, but these

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cases show in addition other central nervous system involvement.

A case of migraine who had periodic hemicrania, nausea and vomiting, visual symptoms and prostration, occurred in a woman of 49 years, who gave a history of two miscarriages, a sickly husband and six living but unhealthy children. A Wassermann test could not be made. However, she was put upon anti-luetic treatment and three months later reported marked improvement.

A case is now under treatment who had the symptoms of Meniere's disease, which diagnosis was concurred in by an aurist. This patient gave a positive Wassermann reaction, and has been given four intravenous injections of salvarsan and also protoiodide of mercury. His symptoms have entirely disappeared.

Again, syphilis may give symptoms closely resembling neurasthenia and hysteria. Neurasthenic symptoms are so common that they need not be more than mentioned.

A case of hysteria is under treatment who has Hutchinson's teeth. She is twenty-nine years of age and has been married eight years. She has no living children but two were born dead.

The hysteria in this case is probably only indirectly related to congenital lues, but it is mentioned as a caution against letting hysteria mask possible syphilitic manifestations. A case of acquired syphilis resembling true hysteria cannot be recalled.

Cases of syphilitic apoplexy, cephalalgia, thrombus, cerebral gumma and meningitis, either cerebral, spinal or cerebro-spinal, occur with too great frequency to be considered atypical manifestations of neurological syphilis. In this connection, however, it might be mentioned that at times one sees a case with cerebral symptoms which the patient attributes to concussion or to sunstroke. Several such cases have been observed by the writer.

In an interesting paper appearing in the August, 1914, number of the *Journal of Nervous and Mental Diseases*, Carl D. Camp discusses the resemblance of syphilis in certain case to paralysis agitans. He concludes that syphilis is not the cause of Parkinson's disease, but may present a symptom-complex resembling it. No case of this character was observed in this series.

Syphilis can closely resemble pellagra, especially in its cutaneous and nervous and mental symptoms. The writer has observed several of these cases. In the syphilitic cases, the gastro-intestinal symptom are not marked. In all doubtful cases, syphilitic tests should be made. It should be remembered that syphilis and pellagra may co-exist and one fatal case in which this was so is recalled.

Impotence is at times the first symptom of syphilitic cord involvement, especiaily in tabes. This has been observed in several cases as a mono-symptomatic expression, the other symptoms of tabes developing later. A negro barber was treated for impotence with potassium iodide in 1909 and reported a year later that the medicine had done him so much good he had married. He has been lost track of since.

Weisenburg and others have pointed out that exophthalmos is often an important symptom of brain tumor. Of course, it may be also a spmptom of cerebral gumma. In June, 1907, the writer reported in the *Journal of Nervous and Mental Diseases* a case of cerebral syphilis with exophthalmos so great that the eyeballs dislocated through the palpebral fissure. The exophthalmos in this case disappeared with the use of iodide and mercury.

One patient was brought, in 1910, with the diagnosis of neuritis of the legs, following dengue fever. His Wassermann test was positive, however, and his so-called neuritis proved to be a periostitis of the tibiae. With anti-specific treatment his recovery was rapid. Every practitioner of experience can multiply examples of symptoms which are the unusual expressions of syphilis.

Hereditary syphilis as the cause of idiocy, feeblemindedness and moral obliquity, is becoming generally recognized. In the examination of children for the Juvenile Court of Richmond, the writer believes that if he put the estimate at 25 per cent of delinquent children showing distinct evidence of congenital syphilis, he would be exceedingly conservative. In this connection, it may be of interest to state that a well-known neurologist has re-

cently found positive Wassermann reactions in eight cases of Little's disease.

Probably the most interesting of the cases of atypical neurological syphilis are the mental cases. Cases presenting the typical symptom-complex of manic depressive insanity, preceding organic signs of cerebral syphilis, have been observed, and also syphilitic cases resembling acute confusional psychoses from other causes. The cases oberved resembling manic depressive insanity have turned out to be paretics, while those resembling acute confusional (or toxic) insanity have been cases of acute cerebro-spinal syphilis.

An electrician, 28 years old, who had been apparently perfectly well, became suddenly maniacal. His delusions were chiefly related to religion. He was a married man with a healthy child, and specific infection was denied. He had to be confined at Westbrook Sanitorium in a strong room. At this time he presented no definite changes in reflexes but a lumbar puncture showed a lymphocytosis of the cerebro-spinal fluid and it gave a positive Wassermann reaction. Later the case developed typical signs of paresis, and in spite of vigorous treatment he had to be sent to an asylum.

Another young married man was examined May 7, 1913, and showed no reflex changes or difficulty with test sentences. He was in a state of exaltation, had auditory hallucinations and gave a history of previous depression. He had been married seven years, had no children and denied syphilis. He was sent to Westbrook, and for several months had periods of alternating mania and depression. Re-examination at this time showed sluggish pupils, diminished knee jerks and Romberg's sign. He has been given eighteen intravenous injections of salvarsan and also mercury, and while improved is undoubtedly a paretic.

Another case was a minister who gave a history of depression followed by a maniacal outbreak. He was also sent to Westbrook. His knee jerks were absent and a Wassermann reaction was positive. He was given mercury and several injections of salvarsan and improved enough to resume his duties, but soon broke down and is now in an asylum, a hopeless paretic.

As an example of syphilis resembling acute confusional insanity, may be cited the case of a married man with two healthy children, and whose wife had no miscarriages. There were no reflex changes, except that his reflexes were sluggish, nor were there any external evidences of syphilis. He was dull, apathetic, confused, irrational and had the appearance of being a very ill man. A Wassermann reaction was positive, both on his blood and cerebro-spinal fluid. He recovered completely in about six weeks, with mercury and six injections of salvarsan, and has remained well for six months.

In closing, it may be said that syphilis as a disease may be mono-symptomatic or practically pan-symptomatic, and between these two extremes it presents many varied symptom-complexes which may resemble almost any known disease. Neurologically considered, syphilis should be excluded in the diagnosis of every case or else we will fail in many instances, not only to sustain our reputations, but frequently also fail to give the patient, who has entrusted his health to our care, definite relief.

DISCUSSION OF THE SYMPOSIUM ON SYPHILIS.

Papers of Drs. Roberts, Lynch, Munroe, Martin, Holland and Tucker.

Dr. E. G. Ballenger, Atlanta: The papers have touched on so many points in this symposium that it is impossible for me to discuss all of them. I think we all agree with Dr. Roberts that syphilis is a very potent cause of heart lesions and of arterial disturbances, such as arterio-sclerosis. I think if Dr. Lynch will examine carefully for arteriosclerosis in those patients who have had syphilis for eight or ten years, who have not been treated or who have been inadequately treated, he will reach the conclusion that syphilis is a very common cause of arteriosclerosis. The tests Dr. Lynch made do not bear exactly on the question from this standpoint, because the patient frequently has a positive blood test without having had syphilis sufficiently long to develop arteriosclerosis.

Dr. Martin called attention to the reactions that follow the injection of salvarsan, and he has given a clear description of these various reactions that we see, and I have not read or heard a better description of these phenomena. I cannot fully agree with him in regard to the endotoxic reaction because I have not studied it as he has done, but I am going to test a series of cases with records of the temperature to confirm if possible this observation Dr. Martin has made. It would be a great advance if we had a test on which we could rely to determine when a patient is cured. I am sure nothing in my work gives me so much concern as to decide when to stop treatment in a given case. I continue treatment until I think the patient is cured, and give two, three or more injections to clinch the cure. I do not try to "toe the mark" merely, but try to get them over into safe ground if possible. I give smaller doses of salvarsan, and more of them than Dr. Martin does. I never give neosalvarsan. I give on an

average about eight fairly good size doses of salvarsan; four at intervals of one week, ten days or two weeks; then four more with somewhat longer intervals, according to the reactions and stage of the disease.

There is one point on which Dr. Martin does not lay sufficient emphasis, and that is the importance of searching for the spirochaete pallida in every genital ulceration. I think then is the important time to treat syphilis. I have given 2,975 injections. I cannot tell you exactly the number of patients treated during the primary stage but I have not yet seen secondary or other manifestations of syphilis follow in those patients that were treated before the secondary manifestations had developed except in two instances. Therefore I feel it is almost criminal to allow these patients to drift along until secondary manifestations develop, until organisms have spread to the nervous system—to inaccessible places—when a cure is much less certain. I think every lesion should be considered syphilitic until we prove it is not. Sometimes the lesions heal quickly, and a search for the spirocheta pallida may be attended with great difficulty. I try never to allow a lesion to heal until repeated careful examinations have been made with the dark field illumination to find the spirocheta pallida. If we are to render these patients great service, it must be done early in the disease before the organisms have spread and developed beyond the lymphatic.

Dr. James K. Hall, Richmond, Virginia: I am glad that Dr. Tucker, in his wisdom, has called special attention to the fact that the most typical feature of syphilis is its atypicalness. The disease is piratical, as well as parasitic, and it sails under no true colors of its own, but most frequently manifests itself under the symptoms of some other disease. I am more and more convinced that the disease ought not to be, properly speaking, a genito-urinary disease, for the genital organs are damaged by it permanently scarcely at all. Likewise, I am convinced that cases of the disease should not reach the neurologist or psychiatrist first for diagnosis. Damage has often been done by that time which is irremediable. The family physician is the member of our profession who should be constantly alive to the universal distribution of this disease, and to the varying methods it may adopt to reveal itself. He it is who knows his patients and their family history better than any of the rest of us know them, and it is the family physician, if he is alert, who will see the disease in the earliest and most curable stages.

It pains me to seem to be pessimistic about paresis at this time when we are hearing so many optimistic things about it. I have observed that the hopeful statements about the curability of paresis proceed from men who live outside of institutions where paretics are treated. Many paretics under some kind of active antisyphilitic treatment improve wonderfully for the first few months; some apparently recover, but most of the apparent recoveries are only temporary remissions, and my own belief is that the disease is practically always eventually fatal. This view is not out of harmony with the adoption of the most modern methods of treatment, but it does tend, and properly so, to keep me from giving too hopeful prognoses.

Dr. A. J. Crowell, Charlotte, North Carolina: The subject of syphilis is such a momentous one that I hardly know where to start in discussing it. It is a disease that we all come in contact with, whether we be surgeons, specialists in genito-urinary diseases, eye, ear, nose and throat, mental and nervous diseases, or general practitioners. However, there are one or two points I wish to mention in regard to this subject. First, if I understood Dr. Martin correctly, he said he did not use mercury with salvarsan. I know how to sympathize with the doctor because I took that stand at one time. When I was abroad in 1913 I asked Professor Ehrlich why it was necessary to give mercury with salvarsan. I did not know and could see no reason for it. They laughed at me considerably when he made the reply in regard to the big guns and the little guns Dr. Munroe mentioned in his paper. That did not satisfactorily answer the question. I had an idea that there might be different species of the micro-organism, and that like malarial fever there might be a remedy that would destroy some of these and not others. We are all well aware of the fact that quinine destroys certain forms of the plasmodia, and that arsenic destroys other forms; but when we arrived in London, and I heard Professor Ehrlich's paper, the explanation came, which was in this way: There are a number of receptors in the micro-organism as well as in the cells of the body. Certain receptors will take up salvarsan, while others may take up the mercury, and thus by the combined force of the different remedies on this micro-organism it brings about its destruction. From the time I saw the reason for the combined treatment to the present time I have been using mercury with salvarsan. Dr. Monroe made mention of this fact this morning in his paper, that we were using the combined treatment, and I have no reason to change my ideas as to this plan of treating syphilis.

I have used considerable salvarsanized serum in the treatment of paresis, and I think it is really perfectly rational and scientific to follow this plan of treating syphilis. When we remember that there is no circulation in the fluid of the spinal cord; that the membranes surrounding or enclosing this fluid are very impervious to the most volatile drugs, and that the remedy does not get into the fluid very rapidly, it is perfectly scientific, it seems to me, to get this remedy from the serum of the blood and put it into the spinal fluid.

Dr. Lewis W. Elias, Asheville, North Carolina: I want to discuss one feature in the treatment of syphilis, and that is a point in technic with special reference to children. In children with congenital syphilis a great trouble in giving salvarsan or neosalvarsan is the fact that the veins are so small that it is almost impracticable to try to get into them. After various experiments Holt and Brown found the veins of the scalp in infants the most easy route to the circulation, and since using that plan, first trying to get into the veins of the arm which are fragile and the veins of the

neck, they stuck a needle directly into the vein of the scalp which in a baby, wrapped in a sheet and crying, will stand out nicely, fixed to the bones beneath, goes in easily. They find, too, you can give a much greater concentration than was formerly supposed. They gave the ordinary dose for a baby in five c.c. of water with a glass syringe. It is given even in 2 c.c. without bad results. This is a simple method of giving salvarsan to infants. It is easier than to inject it into the veins elsewhere and you can give it to a baby without any trouble up to two years of age. After that it is more difficult, as the scalp is thicker and the veins are deeper. When a baby comes into the world hampered by syphilis, it is an innocent party to the trouble, and it certainly needs our best efforts to clear up the symptoms as early as possible. Neosalvarsan will do it within a few days, whereas it will take months to do it with mercury. This point in technic should be utilized. It is not original with me. I reported it in the Southern Medical Journal. I have heard nothing about it since. But the good results possible from it need to be emphasized.

Dr. I. W. Faison, Charlotte, North Carolina: I am not a specialist in any sense of the word in syphilitic work. I have not seen a great deal of syphilis, and I wish I could see no more. But I see cases of this disease occasionally and particularly in children. Whenever I have used persistently an ointment consisting of hydrargyrum chlor mit 10 per cent, I have obtained good results. How does the syphilitic virus or specific cause get into these children? I want to call attention to one feature in connection with these cases from the standpoint of a medical man. When the specialists talk about this condition they should talk about it like medical men. I heard one man speak of it as being due to heredity. It is a microorganism that causes this disease. It is not hereditary, and I am persuaded to believe that there is no hereditary disease on the fact of the earth. I have felt for a long time that insanity was hereditary; I contended it was hereditary, but the experts on insanity whom I have heard discuss the question in the past few years without a single exception have taken it out of the class of hereditary diseases. If that is out, all out. Syphilis hereditary? It is absolutely impossible for a child to inherit syphilis; it is truly a communicable disease. I believe it is due to a living parasite, and how can a child inherit it? How can a parasite be inherited by a child? It can be communicated to him during the time of gestation. If you want to call that congenital, all right. I do not even like that word. Either the father or the mother is responsible for its communication, or both.

Dr. W. W. Hawke, Philadelphia: The tendency is to look upon syphilis as the causative factor for any symptom of disease; especially so where this disease is known to exist. We should be conservative even when syphilis is the evident predominent factor. I was called recently in consultation to see a man, sixty years of age, supposedly suffering from the end results of syphilis, senile dementia. He was in a condition of active delirium. Examination revealed typhoid fever and retention of urine as the causative factors; history of syphilis caused the physician to overlook the other possible causes of his mental condition. Relative to curing paresis by any treatment it is not justifiable to the family or patient to give them this encouragement. When a leg is amputated a crutch is substituted. So in paresis the destructive changes are so great and when the diagnostic stage reached, so permanent, that a cure is impossible. I have never seen any other than temporary benefit from any treatment in paresis. I would say without hesitation that the cases of paresis that are said to be cured were not paresis at all and such reports convince me of an incorrect diagnosis or else the patient is in a condition of a limited remission.

Dr. Stewart R. Roberts, Atlanta, Georgia (closing the discussion on his part): It seems to me that we doctors ought to approach this matter of syphilis with great reverence. It has been the despair of Moses, who probably was the first expert sanitarian, and whether we are correct in regard to our history of syphilis or not, I think it is universally known that it is this disease that proves that the sins of the fathers are visited upon the children even unto the third and fourth generation. It is also the despair of the moralist, because if there is anything before which the average preacher is helpless it seems to me it is the social evil. In the third place, it is the despair of the physician. I have sat here and listened to some of these hopeful statements about the easy cure of syphilis, and the thought recurs to me over and over in my work, as it does to my professional friends, as to whether in the last analysis syphilis is really a curable disease or not. I know we have men who say pellagra is curable, and have cured ten to thirty cases; but it is one thing for a patient to recover from an attack of pellagra, and it is another thing for a physician to cure his patient of pellagra. It is one thing for us to treat the clinical symptoms of cases of syphilis, especially for a time, perhaps for all time in the life of an individual, but it is another thing for us to say that that individual's life has not been shortened or his suffering increased, or that the disease has not been visited upon the offspring in one way or another. Syphilis in medicine is a disease I should show the greatest of reverence for, both as to the moral and social side, as a physician and as a scientist.

I have very little sympathy with any doctrine that teaches that locomotor ataxia or paresis is curable. The ordinary nerve cell is not a cell that regenerates or divides histologically and certainly a nerve cell that is on the way to destruction cannot either regenerate itself or produce other normal nerve cells. We must regard locomotor ataxia not only as a disease caused by syphilis but also as terminal syphilis of the nervous system.

In the next place, I have as little sympathy for the individual who says, "I can cure my cases of syphilis with salvarsan alone." If a person cures syphilis he must drive all the spirochaetes out of the human system or destroy them. As I understand the cure of syphilis, it means that we destroy all the spirochaetes in the system. Whether we can cure these cases with salvarsan, with mercury, and with the iodids, it is still a question.

I have little sympathy for the one who uses only the iodids and mercury. I have little sympathy for the one who uses only salvarsan. We need all the agents at our command to cure syphilis, if it can be cured, and we must treat each case on its own merits.

Dr. Tucker gave us a wonderful talk. If we keep our eyes open as he has kept his eyes open, each of us will usually see what he has seen with its variations. I had a case of Meniere's disease due to congenital syphilis which was apparently cured. I use the word cured in a qualified way, at least. The symptoms were improved with mercury and iodids. Recently a negress came into the clinic with Hutchinson's teeth, and it was learned that each one of the children was badly afflicted with enuresis, and that when these children were given anti-syphilitic treatment the bed-wetting ceased. I have had also a family of five children and all of them in early childhood were bed-wetters, and one carried the habit on into girlhood, and the habit was stopped by anti-syphilitic treatment. There may not have been anything the matter with the bladder, but there was a loss of tone of the nervous system, a lack of strength due, it seems to me, to the congenital syphilis.

Richmond has produced a man who has been to me of invaluable assistance by one remark he made. I refer to the lamented Hunter McGuire. He said he attributed his success in the practice of medicine to the fact that he had always suspected syphilis. This is one golden rule of diagnosis. This disease comes to those on the streets, it comes to aristocrats, it comes to those in the slums, it comes anywhere and everywhere, and it comes when we least expect it. I know my greatest mistakes in diagnosis have been from the fact that I thought a person was so nice and so good that I had forgotten to suspect syphilis. It should be our fundamental rule of treatment to get as close to the trouble as we can with the remedies at hand, and we have in the Swift and Ellis treatment not a treatment that one at present ought to express a terminal opinion on, but certainly a method that up to the present time has warranted its existence. The method is so easy to reach the central nervous system. It is necessary to wait an hour to let the blood and serum rise to the surface, to sensitize in the incubator, with half an hour's application of heat, and mix it with one-half or full strength of normal salt solution, make a lumbar puncture and let the fluid run out and inject thirty or forty c.c. The injection can be done in ten minutes.

Another thing, a great many good men fear to give salvarsan on account of the reaction. I am speaking now particularly of the general practitioner. If one will give salvarsan on the same principle that he does an operation, observing all aseptic and antiseptic precautions, and just before the injection of the salvarsan inject ten or twenty minims of adrenalin solution, or give twenty or thirty drops of the solution by mouth, the reaction —fainting, nausea and slight fever—will be lessened. A Frenchman called attention to this in an article published in the British Medical Journal, and Dr. Gaines, of Atlanta, originated and pointed out that by giving adrenalin solution before salvarsan is given the reaction is done away with. If any of you have given many doses of salvarsan, you must have heard the patient say "my head feels full,' or "the top of my head feels as if it would burst." His heart begins to get rapid, the conjunctival vessels become injected and he often goes off into unconsciousness. That post-salvarsan reaction is due to a sudden paralysis of the vaso-motor vessels of the head and brain. They simply fly open and become engorged with blood. Adrenalin being a vaso-constrictor, contracts the vessels and prevents paralysis due to the chemical reaction of the salvarsan in the blood and tissues.

Dr. K. M. Lynch, Charleston, South Carolina (closing the discussion on his part): I wish only to repeat and accentuate a few words from my paper on account of an apparent misinterpretation on the part of one of the speakers. In these negroes of whom I spoke, as can be seen in the tables, arteriosclerosis did not develop materially earlier in the syphilitic than in the non-syphilitic; neither did a larger percentage of the syphilitic show arteriosclerosis. I did not intend to create the impression that syphilis does not produce arteriosclerosis, but that this condition owes its frequency in the negro largely to some other condition or conditions affecting syphilitic and non-syphilitic alike.

Dr. J. P. Munroe, Charlotte, North Carolina (closing the discussion on his part): I shall not take up very much of the time of the association in discussing the papers that have been presented. When Dr. Faison made his remarks, and later when Dr. Roberts spoke, I was reminded of the fact that when the chairman of the section asked me to present a paper, I first told him I would present a paper on this subject, that syphilis was a disease—a chronic infectious disease—to be dealt with by the general practitioner and not confined to the practice of the specialist either in genito-urinary or in nervous diseases. This morning the discussion was mostly from the nervous men and genito-urinary men. All of us know that in our obstetrical work we have had at various times children born that were syphilitic, and we had to deal with them at once. In that connection I wish to say that there is no paper I have heard in recent years that I have enjoyed more or received more instruction from than I did from the paper of Dr. Roberts. His paper dealt with a phase of syphilis that has come to my attention forcibly in the last few years, and I wish to thank him for the information and for the very full account of that disease affecting the heart and circulation.

I will not recount what Dr. Roberts has presented to you about the Swift and Ellis treatment, and I will not reiterate what I said about the opinion of Ehrlich himself, the discoverer of 606, but I do want to remind you of the fact that in the larger number of statistics presented by the largest hospital in London, published and not contradicted by any reliable statistics presented at the International Medical Congress last summer, the only group of cases out of thousands presented that did not show any recurrence either in the clinical symptoms or in the laboratory findings

were that group in which salvarsan and mercury had been used. Whenever any of my colleagues have shown such a number of cases as that, with no recurrences from the use of salvarsan alone, I shall be obliged to accept the conclusions. Mercury is a mean thing to use by inunction or by hypodermic injection, and if we can cure these cases by repeated and long-continued use of salvarsan, I would be more than delighted. On the other hand, reference has been made to the impossibility of curing tabes dorsalis and paresis. Everybody will admit that when either of those diseases has advanced to the stage that infiltration has resulted in so much formation of connective tissue, you cannot dissolve that tissue. Is it not common sense to assume that if you can make a diagnosis in the early stages and prevent the formation of more than a minimum amount of this new tissue, you are more likely to get a favorable result. If you can eradicate the spirillum, is it not natural you can rely upon and practically cure the disease? It seems to me that certainly is the case. I am reminded in this connection that at the American Medical Association meeting, held at Atlantic City last June, there were a number of papers presented on this subject, and the point which was made by Dr. Roberts on the use of salvarsanized serum into the spinal cord was mentioned, and the thirteen cases referred to by Dr. Holland in which we had such an unfavorable report. So far as my recollection goes that was the most unfavorable report presented out of half a dozen papers that were read. Of the unfavorable reports, all of them were presented by institutional men who were in the habit of receiving these cases in the later stages of the disease, and giving them only institutional treatment. They received them in the later stages and in spite of any treatment death followed; whereas there were hundreds of cases reported where the results were favorable from the use of salvarsanized serum into the spinal cord. I do not believe the results so far have got far enough to warrant us in accepting them as final, and that this is a certain remedy, but so far as my observation goes it is favorable at this period.

Dr. E. H. Martin, Hot Springs, Arkansas (closing the discussion on his part): Dr. Roberts said he has no sympathy for a man who claims to cure syphilis. He did not mean that; he meant he has no patience with a man who makes such a claim. I have had twenty-six cases of undoubted reinfection after having been treated sufficiently with salvarsan and neosalvarsan. I think that is good evidence, at least, that those twenty-six people had been cured. Dr. Ballenger treated one of my cases of reinfection. He can certify to the fact that he found spirochaete in the new chancre. If a reinfection is not proof of a cure, we have no proof of cure. It would take thirty or forty years to come to that conclusion from clinical evidence alone. But members of the profession will come to that conclusion sooner than that whether we have reinfections or not, because in that length of time syphilis will be practically wiped out. That is a broad statement to make but proceeding as we are to treat cases in the infective stage, notwithstanding that there are thousands and thousands of cases of syphilis now, in twenty years syphilis will be a rare disease. Incidentally cerebrospinal syphilis will be entirely wiped out because the cases which would become cerebrospinal twenty years from now are being treated today in such a way that they will not develop the cerebrospinal form of the disease even if not entirely cured.

In reference to intraspinous treatment, it is in my opinion entirely irrational. In the first place a man who is given a poisonous dose of strychnine will show in a short time that blood does reach the spinal centers; if the blood carries the strychnine to the spinal centers it will carry salvarsan to the spinal centers.

A paper has been published in the last issue of the American Journal of the Medical Sciences by Sachs, Strauss and Kaliski, in which they give the findings of Professor Benedict of Cornell, who says that he finds a greater percentage of arsenic in the cerebrospinal fluid twenty-four hours after an intravenous injection of salvarsan than there is in the Swift-Ellis injection itself, that is, if you take out ten or twenty c.c. of cerebrospinal fluid and put back the salvarsanized serum you are not introducing as much salvarsan as you are removing. In my paper I spoke of one milligram in eighty c.c. of cerebrospinal uid after six hours, but Benedict does not give that much, only one-tenth of a milligram in forty c.c. of blood serum an hour after the intravenous dose. The rest has been destroyed or taken up in the cellular elements of the blood and the serum does not contain it. When you consider the fact that you get just as good results from the intravenous injection alone, there is no reason for invading the cerebrospinal space, causing some to be paralyzed and some to die, without adding to the clinical benefit. It is a dangerous procedure. It is an easy procedure for the physician, but it is often hard on the patient.

As to the treatment of cases in a state hospital for the insane such treatment is rarely completed. This is an unfortunate condition of affairs. Treatment of these cases in insane asylums is not completed and will not be completed until legislatures appropriate enough money to buy salvarsan. It costs too much money to cure poor men in state institutions and the opinions of alienists in charge of such places are biased by the results of incomplete treatments. It has not been stated that we can cure tabes or paresis. We only claim that we can cure the syphilis that is causing tabes, but if you stop the syphilitic process and therefore the progress of the tabes, you have done more for the patient than you can do by any other means. All of you have tried and failed with mercury, and if you will try persistent salvarsan treatment and benefit your patients thereby you will be satisfied and keep on repeating the doses.

I fully agree with Dr. Faison that there is no such thing as hereditary syphilis. Children who come into the world with syphilis have congenital syphilis, which they have contracted from the mother, and my observation has made me believe that no father can give his unborn child syphilis except by first giving the mother syphilis.

Dr. Estill D. Holland, Hot Springs, Ark. (closing): One of the speakers stated that the treatment of paresis is not satisfactory in every in-

stance and he is perfectly right. I reported the first case of paresis that I ever treated with salvarsan and I reported another exceptionally good result in a case treated three years later. Both cases were remarkably good results. If you can get such results in any cases of paresis with salvarsan you are fully justified in using it.

The intravenous injection of salvarsan will not cure every case of paresis or tabes dorsalis, but it will cure some cases.

The first case of paresis I reported was treated nearly four years ago and he was rational and able to attend to his business inside of five months after the injection of salvarsan. We might have obtained the same results with three or four years of mercurial treatment, provided the patient could have stood it.

Dr. Roberts says that a nerve cell cannot regenerate. We all realize that that is so, but a great deal of the loss of reflexes that we get in tabes and paresis is due to pressure on the nerve trunk from the infiltration due to the inflammation and not due to a degeneration. You get an inflammation which causes a pressure on the nerve trunk and gives the same symptom as a degeneration of the nerve trunk. All you can expect to do is to stop the inflammation before it destroys the nerve, and where you can do this you get a quick result.

You can take some cases of tabes dorsalis who can hardly see to find a chair in a room, give them salvarsan and they can read the headlines in a newspaper in twenty-four hours. This simply means that the inflammation has been reduced until the reflex of the nerve has been re-established after having been lost, not through destruction of nerve tissue, but through pressure due to inflammation. In these cases it is certainly better to give the patient the benefit of the immediate stoppage of this destruction with salvarsan, than it is to wait several weeks or months for mercury and the iodides alone to take effect.

Some say that there is no use in using mercury when you use salvarsan. We treat malaria with arsenic and quinine; we do not need the arsenic in most cases but we use both. If you have two or three good agents that work together for a certain result, use them all. Every syphilitic patient, no matter what stage he may be in, should have two or three full doses of salvarsan with full doses of mercury in between, and the salvarsan about ten days apart. If a patient has any of the late manifestations of syphilis he should have iodide in some form in connection with the mercury.

I do not believe in treating any patient with straight mercury or straight salvarsan. Unless for some special reason, I think we should always use both.

SOME FACTS PERTAINING TO THE WASSERMANN REACTION IN RELATION TO DIAGNOSIS AND TREATMENT.*

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Since the advent of the Wassermann reaction of blood serum and spinal fluid into the realm of diagnostic and prognostic medicine, some very interesting and instructive lessons have been taught. We have learned first to consider no case of syphilis as "cured" until a definite study of blood and spinal fluid has been made. Secondly, we have also refrained from discharging patients until a "provocative" salvarsan administration has occurred with a Wassermann test of blood serum in the following week. Thirdly, we have learned that a serological curve of blood serum is essential during the course of treatment of any case. Again, we have learned to classify neurological disease better by making a study of the serology of blood serum and spinal fluid in all such cases. We have also learned that a series of Wassermann tests is far more rational and instructive in clearing up obscure cases than is the old method of application of the "therapeutic test."

We have learned to control our treatment of these reactions, and more especially we have been interested in more closely following the reactions during the course of the more laborious method of treatment of cerebrospinal syhpilis by salvarsanized serum injections into the intra-rachidian space.

*Read before the Physicians' Club, St. Louis, Mo., January 14, 1915.

These are, in brief, the lessons that have so far been taught. It shall be my task to go over some of these lessons, speaking from the standpoint of the consulting serologist and syphilologist. Our work here in this institution has been singularly interesting in that many of the results of our laboratory data have been obtained, as it were, in the dark, with no clinical history, hence with no bias, conscious or unconscious Afterwards the clinical data were given us by our consulting friends. We have been furnished opportunities time and again to follow out serological curves.

The problem of stating when a "cure" of syphilis has been established is one that has been for years the "bete noire" of the practicing profession. It would be interesting reading to ask every physician who has been handling syphilis before and since the advent of the Wassermann reaction just what his answer would be to the question of "when is the syphilitic 'cured' of this disease?" Let us cite a case: A patient has been pronounced a syphilitic. He has had a secondary skin manifestation. He has taken say two years "mixed treatment," salvarsan and mercury and iodide of potassium. He has had a series of Wassermann reactions performed. For a year they have been negative. What ought we to tell him? He may wish to marry. What shall we say? We may be asked by him what are the chances for a later neurological complication, tabes or paresis. How much of a "risk" is he, viewed in the light of an insurance policy?

We would state, first, that he must have been adequately treated for at least two years. By "adequate" treatment I mean vigorous and intensive treatment with salvarsan and mercury. I am free to confess that I am one of those who regards salvarsan as a most important adjunct to our modern therapy of syphilis. Some there are within our ranks, some of high and some of low degree, who unmercifully condemn this agent. The curses of high heaven have been invoked against Ehrlich and his remedy. No less an authority than Finger, of Vienna, has inveighed against it, and in a voice of equal force and bitterness Gaucher, the dean of the active syphilologists of Paris, has protested against its use and has doubted its usefulness. And there are others, too, lesser lights, men of but little experience with either mercury or salvarsan, who say they do not believe in it. Predictions have been frequently made by some of these lesser lights of all kinds of dire consequences that will accrue to those of our patients into whose veins this dreadful remedy is injected. Their arguments have ranged from the possibility of instant death following its administration, down to total blindness, the onset of precocious brain syphilis, the disintegration of brain and spinal cord and a waiting crowd of paretics and tabetics in future years to stand as mute witnesses of our iniquity in treating this disease with this agent. Without entering too deeply into this question, I must admit that my belief in salvarsan is based upon its wonderful immediate effects upon cutaneous and mucous membrane lesions; upon its rapid action in hurrying the patient through a disagreeable and contagious period of the disease; in rapidly getting rid of tertiary lesions, and finally in assisting in ameliorating certain types of cerebrospinal syphilis. As for the predicted increase in the number of cases of "precocious" brain syphilis that is certain to follow the use of salvarsan, I would point to the fact that salvarsan has been in use now for something over four years, and I do not believe that the profession has yet been struck by any unusual number of cases of precocious brain syphilis. And in four years the term "precocious" becomes outlawed if brain syphilis has not occurred. Finally, as to the predicted increase in tabes and paresis I have no answer as yet to make. Time alone will answer that. But in passing I would ask those who stoutly believe in a non-salvarsan course of treatment to explain away the multitude of cases of cerebral and

spinal syphilis that now crowd our consulting rooms and institutions. And, too, to these very same men who presume to deny to these brain and cord victims the benefit of salvarsan medication I would ask for evidence of *their* ability to make any kind of restoration or improvement whatsoever among these people with their mercurial of iodide therapy. I will take up later the benefits that can be shown in the treatment of cerebrospinal syphilis by means of salvarsanized serum.

Getting back to our original proposition it can be said that with the adequate treatment should be coupled the fact that Wassermann reactions of blood serum should be made from time to time during the course of treatment.

How often this should be done is a matter of choice with different workers. Ordinarily, every three months should suffice. Not only the Wassermann test should be used but also one which gets rid of the natural amboceptor found in 98 per cent of people, and one, too, that deals with unheated sera. The presence of natural amboceptor and the heating of blood sera serve to convert many weakly positive Wassermann into negatives. This has been shown by me to give a difference of 15 per cent as regards positive findings. For this purpose the writer utilizes a method called the Hecht-Weinberg test, a working modification of which having been reported by him in a paper published in Journal A. M. A., July, 1914. A present experience of over two thousand comparative serological tests, using the Wassermann and the Hecht-Weinberg methods, has convinced me that the Wassermann alone is inadequate in our "control" of treatment by serology. Therefore, I would insist that the ideal negative reaction is a negative Hecht-Weinberg as well as a negative Wassermann. Six months after the termination of the two years, a lumbar puncture should be performed and a complete examination made of the spinal fluid, a Wassermann, a cell count and an estimation of excess of globulin and albumen. The Wassermann should be performed, using the Hauptmann method of rising strengths of fluid, 0.2, 0.4, 0.6, 0.8 and 1.0cc. The cell count may be made with the Fuchs-Rosenthal counting chamber.

Granting that all these tests result negatively, in the absence of any clinical symptoms, we may tentatively say that we have restored the patient to as nearly a normal condition as we can hope to do. Some there are who may take exception to even this position, asserting that proof positive of "cure" cannot be gained even by this method. We believe, however, that if every physician followed out a routine of this kind he would have done his full duty by his patient. If possible, further observation of the case is timely, and should be practiced. The average patient, however, will not remain under treatment more than two years.

The use of the "provocative" injection of salvarsan has been advocated in estimating the "cure" of a patient. This means the injection of salvarsan into a patient who has given a series of persistent negative Wassermann reactions. It has been claimed that if such a patient is given salvarsan and the infection still exists, it will make itself manifest by the appearance after a few days of a positive reaction. Our policy is to ask patients to go through with this test. Many refuse. They are champing at the bit at the end of two or three years, and want no more of treatment even if it is in the form of a test. Those who consent should be given this test as it seems to be very useful in clearing up the question of "cure."

Those cases which show persistent positive Wassermanns during the course of treatment, sometimes after a year, sometimes after even a longer period, dishearten and discourage many physicians and patients. Our belief is firm that they represent cases that require more intensive and more prolonged treatment than the average one just cited. In no case in our experience has a case failed to become negative that was treated from the inception of the malady along the line of combined salvarsan and mercury therapy. They should

not be discharged or permitted to marry until their Wassermann becomes negative, no matter how long this may be.

The reaction may persist and hover for a long time on the border line, but the enemy will surely be routed if more fire is concentrated upon him. I believe that the earlier the case is put under treatment, the more probable it is that "sterilization" of the disease may be accomplished.

This brings us to a consideration of the value of the Wassermann in the treatment of the latent case, the obscure case, the tertiary case, the case that has had syphilis a long time ago, the case that had little or no treatment, either through the patient's own neglect or through the negligence of the medical attendant who failed to appreciate the necessity of intensive treatment. In these cases a Wassermann reaction will often make the diagnosis where all else fails. Cases are legion that have gone the rounds and have been treated for everything but syphilis. Some there are that deny ever having had syphilis, denying either a primary sore or a secondary skin manifestation. Some lie and others don't know. Some are late congenital cases that naturally know nothing of their parents' infection. *Possibly the most monumental sin that besets the profession today is its readiness to accept any statement from any patient regarding the history of a past syphilitic infection in so far as it has any bearing on the inclusion or exclusion of syphilis in explaining a present obscure disease.* We are too prone to ask a patient whether he ever had syphilis, and on being told "no" to accept this as final proof that he cannot possibly now have the disease. We are also too much inclined to regard the patient's respectability as offering a bar to the existence of syphilis.

We are too prone to think of syphilis as the last explanation instead of the first in seeking the cause of something obscure. Some of us are overawed by the apparent or real chastity of our patients, particularly of the female sex. Sex, age, social position, marital status, nothing should stand in our way in investigation of disease. And there should be no hesitation once the diagnosis is made in telling the patient the real nature of his disease. It is in this class of patients that the Wassermann looms up as the great hope of diagnosis. The blood serum examination usually suffices to pin down the existence of a stomach or liver or heart or lung syphilis.

So far as a means of control in such a case, we can only state that the treatment of a latent or tertiary syphilis means continual and continuous observation over many years, checked from time to time with Wassermann reactions. No statement of any kind touching upon the length of time necessary to "cure" or "sterilize" tertiary syphilis can be made. Our policy should be one of intermittent attack, possibly throughout the patient's entire life. In this way, and in no other, is the physician performing his full duty. Any deviation from this policy exposes the latent or tertiary syphilitic to a fresh outbreak of his disease.

The study of syphilis of the nervous system with serological methods has thrown new light on this subject. We have clinched the theory that paresis and tabes are due solely to syphilis. We have been enabled to recognize these diseases in their pre-paretic and pretabetic stages. The Wassermann reaction of blood serum and spinal fluid has permitted us to better classify many neurological conditions. The serology of spinal fluid, as a rule, gives us much more information than does a similar study of the blood serum. Many cases of tabes show no reaction in blood but a very definite reaction in spinal fluid. Many cases of tabes in the incipiency are not recognized The profession has not yet learned to suspect tabes when the patient complains of pains in the legs, of failing sexual power, of vague gastric symptoms. Close inspection of these cases will show tabetic pupils, absent knee jerks, Rombergism, etc. A spinal puncture will do the rest. A Wassermann of blood will often fail to help the clinician in his search

for tabes, and what is worse, will often make him dismiss the diagnosis completely from his mind. Many physicians regard a lumbar puncture as too serious an operation to be suggested except in very unusual cases. They fail to appreciate two facts, first, that it is not a severe or serious operation; secondly, that without it we cannot accurately make a diagnosis of syphilis of the nervous system. I would rather not see them make a Wassermann test at all if only the blood serum is searched. A failure to find it in the blood serum too often takes their mind off the possibility of syphilis of the nervous system. Lumbar puncture is necessary and imperative in these cases. Beware of the comfortable old diagnosis of "rheumatism." Beneath its venerable clothing lurks often a luetic affection of the cord, masquerading as a harmless although painful affection. A failure to heed this advice will enable the patient's street acquaintances to make a diagnosis of tabes before his medical man. We ought naturally to try to recognize disease before the layman does for the sake of our own self-respect if for nothing else. While not in any way wishing to endorse indiscriminate lumbar puncture, we certainly must maintain that it is a procedure by far too much neglected in searching for syphilis.

Attention must also be called to the necessity of a serological curve of spinal fluid. More than once have we seen a variation in spinal fluid as regards the Wassermann at different times independent of treatment. In one case of suspected gumma of the cord which the gentlemen present saw at our last meeting, we found a positive reaction in the spinal fluid at one sitting. One week later, the spinal fluid showed a *negative reaction,* there having been no treatment in this interval. A few weeks later, after an intra-spinal injection, a strongly positive Wassermann was found. We have seen four cases of outspoken tabes that had never had treatment, with negative Wassermann reactions. In one case, we saw a positive supervene after two weeks. This emphasizes the need of repeated lumbar punctures when the occasion demands it.

This brings me to the last consideration, namely, the usefulness of the Wassermann in controlling our treatment of syphilis of the central nervous system by means of the injection into the subarachnoidal space of salvarsanized serum. Swift and Ellis, who have been foremost on this Continent in advocating this method, have given it as their opinion that the injections should be continued until negative reactions occur; when the reaction becomes negative, then it usually remains so and we may speak of the case as having been arrested. After an experience of something like one hundred and seventy-five intraspinal injections in fifty-two cases, I must in a measure disagree with this statement, although my earlier opinion as given in a paper read before the Cincinnati Academy of Medicine in May, 1914 (see Cincinnati Lancet Clinic, July 11, 1914), practically supported the above writer's belief. In some of my cases reported at that time as having become negative under the influence of treatment and having remained so, subsequent lumbar punctures have shown a reappearance of the Wassermann reaction. The reappearance of this reaction in no way was indicated by any backsliding on the part of the patient, so far as physical signs go. On the contrary, there had been in these cases even after the cessation of treatment a progressive improvement. I wish, therefore, to be understood as going on record in denying that the changing of a spinal fluid from positive to negative during the course of the intra-rachidian injection of salvarsanized serum means complete arrest of the process or a serological indication for stopping treatment. Our policy should be to reduce the reaction from positive to negative, to watch the physical signs, and, above all things, to continue making lumbar punctures and Wassermanns and, on the reappearance of a reaction, to be prepared to continue the treatment again with subsequent watching and waiting. In this way and in no other can we hope to arrest

and to stay the progress of these cord changes.

Briefly, then intensively treat syphilis and have your serological curve at hand, both of blood serum and spinal fluid. Look for syphilis with laboratory methods when the case is obscure, just as you would use your stethoscope or your ophthalmoscope.

Remember that sparing the lumbar puncture needle means spoiling the patient's chances for relief and your own diagnostic reputation. And when you are dealing with salvarsan medication in the spinal canal, remember that many lumbar punctures are to be made before treatment should be stopped and that there are eccentricities in spinal fluid reactions just as there are in blood serum.

803 N. Garrison Ave.

A SIMPLE AND EFFICIENT CONTRAST STAIN FOR B. DIPHTHERIAE.

By G. McF. Mood, M.D.,
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PRELIMINARY REPORT.

Several years ago, it being observed that old alkaline methylene blue would at times color some of the polar granules of B. diphtheriae, red, attempts were made to produce this contrast staining effect constantly. Many methods were tried, each of which produced either no contrast stain at all, or gave a decided polychrome effect.

A few months ago, however, a method was finally perfected by which methylene blue is converted by oxidation into methylene red, within the polar granules, during the process of staining.

The stain as perfected is as follows:

Sat. Alcoholic Sol. Methylene-blue (Koch for Bact.) ..... 1 part
Hydrogen peroxide ..... 9 parts

Should be kept in a well-stoppered bottle.

Methylene-blue, Koch for bact. has been specified, because other forms used failed to give the desired result.

Any peroxide which we have tried was found to be efficient.

The stain may be kept for several weeks after mixing, provided it be placed in well-stoppered bottles; samples placed in white glass bottles upon shelves in the open laboratory for six weeks were unaffected in any noticeable way, and retained the specific staining properties unaltered.

In using the stain, the specimen is prepared and fixed in the flame, as for ordinary specimens, and the stain allowed to act for from thirty seconds to three minutes. Upon its application, there occurs usually in about ten seconds a rise of small gas bubbles to the surface, this continuing for from thirty seconds to three minutes. As soon as this rise of bubbles ceases, the specimen is sufficiently stained. One minute has been found best for the majority of specimens, and is recommended for routine work. There is no danger of overstaining, as a half hour's exposure will not darken the B. diphtheriae appreciably, but has the disadvantage of staining some of the other organisms present in cultures from throats darker than when the time of exposure is shorter. The contrast effect upon the B. diphtheriae is, however, unaltered.

The specimen may be dried, either in the air or with the application of a small amount of heat—the latter not altering the contrast effect—and mounted in balsam.

B. diphtheriae will be stained as follows: Bodies a pale pigeon egg blue, polar granules a bright red.

Other throat organisms ordinarily present usually take a very pale blue color, even paler than the bodies of the diphtheriae organism, in some specimens, forming here an almost homogenous pale blue background. When these various organisms stain darker, they are quite clear enough not to be confused, morphologically, with the diphtheria organism. A coccus has been encountered occasionally

which retains a pale pink color; this lighter shade with its shape differentiating it from the diphtheria bacillus. Again, a yeast has been encountered the ascopores of which retain the red color. Here it is not especially confusing, except when the cells are very small, when they may be mistaken for coccoid forms of B. diphtheriae.

Advantages observed:

A single stain, easily prepared, and with good keeping qualities; rapidity of staining —one-half to two minutes; good contrast colors, pale blue and bright red, a contrast especially well seen when white artificial light is employed; specimens will not overstain even if left for a half hour.

Over 600 specimens have been stained, 300 containing B. diphtheriae, and 300 negative specimens, containing simply the various bacteria present in the throats at the time the cultures were taken. Much work has been done checking the results obtained with this stain against those obtained with preparations from the same cultures, stained with the various accepted polar granule stains—Loeffler Alk. Methylene-blue, Neisser, Modified Neisser (with Grams solution and neutral red).

In each case the above stain has indicated the presence or absence of the B. diphtheriae uniformly with these recognized stains.

This stain is not applicable to smears taken directly from the throat, it failing to stain the polar granules, the organisms when present staining homogeneously a very pale blue.

After about eight hours' incubation at 37.5°C. upon Loeffler's blood serum mixture, many of the organisms show small polar granules, each taking the stain well; the number and size of granules increasing rapidly as the time is lengthened, so that at the end of sixteen to eighteen hours well formed granules appear in practically all the organisms, except the last generations, which stain very palely blue, and are rather hard to distinguish, so that at first glance every organism seems to contain one or more granules.

Cultures which have been kept in the laboratory for weeks, although the typical bacilli have disappeared, show in smears made from them numbers of round oval or irregular granules, these taking the stain typically—a bright red. One culture, kept at laboratory temperature for nine weeks, the vegetative properties having almost disappeared so that it was started growing again with difficulty, showed these granules splendidly.

Sufficient work has not been done with B. pseudo-diphtheria and other diphtheroids to report upon any differential properties which this stain might possess.

AUTHORS' ABSTRACTS.

Medicine.

Two and a Half Years' Experience with the Phenosulphonephthalein Test. By Samuel Logan, New Orleans, La. New Orleans Medical and Surgical Journal, February, 1915, pp. 686-697.

In a series of 425 cases Logan reports his findings, which are very favorable as to the value of this method. Great emphasis is laid on the need for exactness. He has found the best results by the use of intravenous administration with an all-glass solid piston syringe.

Where the need of an exact knowledge of the kidney functional capacity is the greatest, this test has been found of greatest reliability and value. His best results have been obtained in the uremias, nephritis, and surgical conditions dealing with the genito-urinary system. In prostatic cases, each one should be tested frequently, prior to operation, and the latter ought only to be done after the kidneys have recovered to the highest degree of function, as indicated by the phthalein elimination.

In surgical conditions he sums up his experiences in a series of axioms as follows:

(1) Obstruction to the outflow of urine causes more or less delay in appearance of the phthalein and decrease in the output in proportion to the degree of obstruction.

(2) Percentage of output is not necessarily in proportion to the pus or infection present in the kidney urine, unless an obstructive condition be present.

(3) Renal tuberculosis causes a decrease in output out of all proportion to the extent of kidney area involved. This is a strong diagnostic point.

(4) Reflex (sympathetic) interference of a diseased kidney with the output of its healthy mate has not been observed.

(5) Neoplasms and cysts affect the output only from the degree or cortex involved or from the production of obstruction.

Some Clinical Observations of Mouth Infections as a Source of Systemic Diseases. By L. P. Robertson, Marlin, Texas. Texas Medical News, January, 1915, pp. 283, 284.

We have observed for many years, in an empirical way, the relation of mouth infections to systemic diseases through noting the steady and in some cases rapid recovery of patients from a general debility, which seemed almost cachectic, after extracting all teeth affected by pyorrhea, alveolar abscesses and caries. Without any further treatment than the elimination of the focus of infection, these patients would return to normal health, gaining fifteen or twenty pounds in six months. It remained, however, for the recent bacteriological studies of Hartzell, Billings, Mayo, Rosenow, Streit and others to show that these infections may invade the whole economy, producing serious sequela.

The systemic diseases which may be caused by mouth and naso-pharyngeal infections, as we now understand this question as an etiological factor, may be grouped under the broad heading of pyemia, bacteriemia, septicemia, arthritis, synovitis, pernicious anemia, endocarditis, toxic neuritis, pernicious rashes and allied affections.

With this formidable array of diseases which may be caused by these toxic poisons in the oral cavity the importance of careful inspection of the mouth, nose and throat in diagnosis is readily recognized.

Pyorrhea alveolaris and alveolar abscesses are the pathological conditions in the mouth most responsible for harboring these toxins.

Emetin has merit in the treatment of pyorrhea, but is not a specific. It is indicated in the primary stage. The treatment indicated in the advanced statges of pyorrhea, where we have an osteomyelitis is curetting and autogenous vaccine.

Subacromial Bursitis. By Sterling O. Fields, Newport News, Va. New York Medical Journal, January 23, 1915, pp. 163, 164.

The condition is frequently overlooked. The symptoms and signs admit of ready diagnosis though the three stages of Codman are seldom clear out and distinct, and the sign of Dawbarn is often lacking. The etiologic importance of direct shoulder blows is questioned. Though falls are an important factor their influence on the shoulder is discounted. One unconsciously thrusts out his hand or elbow always to catch the shock of the impact. The force travels up the arm and damages the bursa between the acromion and the major tuberosity. Excessive use of the shoulder is a factor in a small proportion of cases. The writer states in his experience infection has furnished a percentage of cases nearly as high as trauma. Dissatisfied with the comparatively lengthy period of disability resulting from the usual routine treatment of subacromial bursitis, the writer decided to employ a plan somewhat similar to that now used by many authorities in joint inflammation. After aseptic preparation the skin is nicked with a scalpel under local anesthesia, an aspirating needle introduced into the sac with arm at the side, and the bursal fluid, if any, is withdrawn. Through the same needle two to four cc of five per cent iodoform-glycerin emulsion is introduced, the needle wound sealed with collodion and gauze, and the arm slung across the chest with the elbow supported. There is almost immediate relief of pain as a rule. In twelve days gentle massage of the shoulder is begun with gradual passive and active movements. In three days more the sling is permanently removed and the patient encouraged to move the shoulder freely, and the eighteenth day sees the patient ready for work. So far, the results have been most satisfactory.

Use of Raw Starch in Treatment of Diabetes Mellitus. By E. B. Knerr, Kansas City, Mo. Missouri State Medical Association Journal, February, 1915.

A safe form of carbohydrate is raw starch, either as prepared artificially from the various grains or as it occurs directly in uncooked vegetables. The starches become harmful for diabetics when cooked. In the raw state the starches are digested so slowly, chiefly in the intestines, that the patient can assimilate them without being overwhelmed. Even raw potatoes may be eaten by the diabetic without harm. Of course, vegetables, such as sweet potatoes, beets, yams, parsnips or others rich in sugar, must be avoided even when raw.

Treatment consists in putting the patient to bed and allowing him nothing whatever to eat except a dram of raw starch stirred in a glass of water every two hours, until his sugar disappears. This may usually be accomplished in twenty-four to seventy-two hours. There is no danger of coma as the raw starch clears up the acidosis; and the patient does not suffer greatly with hunger, as there is considerable nourishment afforded by the raw starch. Starch inhibits acidosis. Whiskeys and wines are worse than useless, as they usually contain more or less sugar.

When the sugar has disappeared the diet is gradually increased, first by allowing green foods, then meats, eggs and cheese, sparingly. The patient may go to work if he is at all able, but every week or two he should stay in bed a day and eat nothing but raw starch stirred in water. No effort should be made toward increase in weight. The thought should rather be for well-being and well-feeling, with the ability to work without the old diabetic tire. This is better than gain in flesh.

The Treatment of Diabetes Mellitus and Its Underlying Principles. By Jacob Gutman, Brooklyn, N. Y. The Post-Graduate, February, 1915, pp. 110-124.

Medications are of no value unless for specific purposes or of special use in the control of pernicious influences from the cerebro-spinal system. The dietetic treatment is the only one. The amount and variety of proteins and fats have to be regulated in accordance with severity of the case and the direct demands made upon the organism. The quantity of food must calorimetrically suffice not only to replace the energy expended in the ordinary processes of metabolism, but also to replace the losses incurred by the excreted urine energy material, the sugar. Measures must be taken to curtail the general metabolism of the individual and to restrain thus the activity of the sugar producing mechanism of the body. The possibility of coma must not be underestimated, yet true acidosis must be differentiated

from alimentary acetonemias. The latter need not cause grave anxiety, as they are easily amenable to proper treatment.

The goal to be reached in the treatment of diabetes is the raising of the tolerance for carbohydrates. Once that is achieved the case may be conscientiously considered improved if not cured. Every means must therefore be employed to achieve such increased toleration. For such purpose it is necessary to keep the patient sugar free for longer periods; then the toleration for sugar increases. This is accomplished by a determination of the amount tolerated and by keeping the patient on amounts of carbohydrates not exceeding two-thirds of the quantity tolerated. To increase the comfort of the individual thus treated the carbohydrate may be administered in various forms, but always of equal calorific value.

Pleurisy with Effusion. By John Staige Davis, University, Va. Virginia Medical Semi-Monthly, February 26, 1915, pp. 547-551.

This article deals with the recent experience at the University of Virginia Hospital in fifty-one cases of the trouble. After a brief summary of the clinical features, the operative treatment is discussed at some length. In aspiration the value of the special two-way blunt Floyd needle with stylet is pointed out as combining the advantages of both the ordinary needle and the trocar and minimizing the objections to each. Syphonage and suction are compared and the latter rather advocated as more likely to be successful and also safe, if due care is observed in the slow withdrawal of fluid. 1,000 cc. is advised as a safe average first evacuation.

Special reference was made to two cases of left-sided effusion in which, after repeated tappings, securing less fluid each time, nothing more could be gotten on any safe suction despite conclusive evidence of an abundance. Relief was obtained in one by an artificial pneumothorax, which permitted 2,000 cc. to escape, and in the other by auto-serotherapy, though the latter caused a violent febrile reaction which gave grave uneasiness. The former method is preferable, as the other may generalize or relight an old infection.

No operative fatalities were reported, but once an intercostal artery was punctured and the hemorrhage controlled by pressure, after formation of a hematoma.

The importance of regarding all such cases as tuberculous, if not proven otherwise, is insisted upon, and the consequent value of treating them as actively infected for at least a year is recognized.

Occurrence of Exudates During Treatment by Artificial Pneumothorax. By A. G. Shortle, Albuquerque, N. M. New Mexico Medical Journal, January, 1915, pp. 117-124.

This article reviews the literature of the subject and gives the experience of a number of American operators and occurrences among sixty-two cases of the author. Probable causes: Tubercle formation on the pleural surface, tearing of adhesion bands, puncturing the pleura too frequently in a circumscribed space, injection of cold nitrogen, circulatory changes induced by the collapse.

Percentage of Cases: T. von Muralt, of 64 cases who had completed treatment, 54½ per cent Zeigler, in 60 cases, 50 per cent. The time factor appears to be important. Of author's 62 cases having collapse, 30 per cent had pleural exudates. Taking, however, 22 cases under treatment from one year to two and one-half years, 65 per cent developed fluid; of discharged cases, 75 per cent. Extent of involvement also a factor. Of the author's cases, the very serious had exudates in 51½ per cent; in moderately serious cases, 22 per cent; in less serious cases, 12½ per cent.

The fluid showed high specific gravity and large amount of albumin, with preponderance of lymphocytes. Only two showed tubercle bacilli by staining methods. None of them had pus germs.

In author's opinion, if property treated, pleural exudates are not likely to result in permanent harm, unless they are due to pus germs. Treatment is aspiration of exudate and replacement of gas or air. In pus infections, treat as any other pleural empyema.

Some Observations on the Nervous and Mental Symptoms of Heart Disease. By Joseph Irwin France, Baltimore, Md. Journal of the American Medical Association, February 20, 1915, pp. 652-654.

Head (Brain, Vol. XXIV, 1901) described the marked nervous and mental symptoms which are often found in cardiac disease. From a study of his cases, and a limited number of my own, I reached the following tentative conclusions: (1) Cardiac muscle strain and irregularity are sufficient to create an emotional state of depression, anxiety and fear, with or without hallucinations. (2) The first mental symptoms appear in the hypnagogic or sleep state. Freudians should always take into consideration the condition of the circulatory apparatus and its functions. (3) Distressing dreams may be premonitory symptoms of cardiac trouble. (4) Fifth nerve neuralgia may be of cardiac origin and may come on early in failing compensation. (5) Neuralgia of the fifth nerve in patients over forty may be due to increasing cardiac strain. Observations made by Head are of very great practical value to the physician and are interesting because of the bearing they have upon important psychologic and psychiatric problems. Every physician, in the interests of psychiatry, should carefully investigate, as far as possible, the nervous and mental symptoms, accompanying physical disease, and, it would be desirable, if every general hospital could have a psychologic laboratory for the investigation of suitable cases. This preliminary and, perhaps, premature paper is offered in the hope of securing the interest and co-operation of others in this line of investigation.

TROPICAL DISEASES AND PUBLIC HEALTH

FIFTY CASES OF INTESTINAL PARASITES IN ADULTS, WITH AN ATTEMPT TO STUDY SOME SYMPTOMS CAUSED BY THEM.

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Any physician will admit that he does not examine the stools of his patients often enough. Everyone, wishing to make a thorough examination of his patient, will request a specimen of urine, and perhaps of sputum, for examination, but I believe it is exceptional for him to request a specimen of stool, unless there is a direct history of the passage of worms, or blood, or unless some other abnormality of the stool has been called to his attention.

Even hospitals neglect his phase of the examination of patients, and the hospitals in this country, where routine examinations of the stools are made, are few in number. Yet a routine examination of the stool is often just as important in clearing up a diagnosis as is a routine examination of the urine, as I shall endeavor to show.

The reason for the neglect of stool examinations is self-evident. In the first place, stools are excedingly hard to obtain. The false modesty of many patients makes them very reticent even about speaking of stools, much less trying to obtain a specimen. The physician, on the other hand, has a more or less natural disinclination to handle these specimens, and many of them, from lack of practice, are not skilled in this work. Finally, there is a tendency, even among trained laboratory men, to make one hasty examination of the specimen, and, if nothing is seen at this one examination, to give a negative report. When we consider the large amount of intestinal contents compared with the small size of some of the parasites, and the paucity of their eggs, the wonder is, to my mind, not that we find so many infections, but that we find any at all.

If one makes a very careful study of parasitology, using all of the modern text-books, and reading all of the available articles, he will find, when he has finished, that he still has a very hazy idea of the role of intestinal parasites in disease; excepting, possibly the diseases of amoebic dysentery and hookworm. Usually the symptoms are grouped together for all the parasites, and it is declared that any one of them "may, or may not cause symptoms," and the feeling is, after such a perusal, that no symptoms are caused at all, as a rule. Practically no one would attempt to make a diagnosis of infection with intestinal parasites, without finding the parasites in the stools, except, possibly in the case of hookworm or amoebic dysentery.

The impression is also prevalent that intestinal parasites are comparatively uncommon except in the tropics. As a matter of fact, recent work has shown that intestinal parasites are much more common than was formerly supposed.[6] Still,[1] of London, found 32 parasitic infections in 100 consecutive autopsies among children. Schloss,[2] of New York, examining stools of children applying to the dispensary for treatment, regardless of complaint, found that about 11 per cent were infected with some form of worm. Cecil,[3] of New York, found whip worm or pin worm infection in 15 per cent of their operative appendicitis cases. Wilson,[4] in the British Medical Journal, reports 20 pin worm infections in 100 consecutive autopsies on children.

*Read in Section on Medicine, Southern Medical Association, Eighth Annual Meeting, Richmond, Va., November 9-12, 1914.

Some work has recently been done in the Mayo Clinic at Rochester, showing an unexpected number of parasitic infections among adults coming from the northern parts of the country, where parasites were formerly not supposed to exist.

In this paper I shall consider only the common parasites, taking up first the amoebae. Amoebic dysentery is, of course, comparatively easy to diagnose microscopically, if the stool is examined while the amoebae are motile; in fact, it is usually diagnosed by the practitioner without the aid of the miscroscope. It seems quite possible, however, that patients may harbor pathogenic amoebae in their intestines, which, while not causing the typical dysentery, may, nevertheless, cause certain definite symptoms and ailments. In the same class with the amoebae are numerous other so-called harmless parasites, which are not uncommon and which resemble the amoebae in their morphology. They are the cercomonas, trichomonas, lamblia, blantidium, coli, etc. Occasionally an author is found who claims that some one of these is pathogenic,[7] and who will cite cases of diarrhoea,[8] anaemia,[9] etc., which he atributes to them, but, at present, very few authorities place any emphasis on them as producers of disease; yet, it is hard to see why they could not cause symptoms, and it is my belief that if these infections are studied carefully and over a sufficiently long period of time, it will be found that they do cause symptoms, sooner or later.

The common tape worms in this country are the saginata and hymenolepis nana. The tinea solium is rarely found. Contrary to the usual impression, the hymenolepis nana is the more common of the three. It is practically never diagnosed by the general practitioner, however, because it is so small, measuring only 10 or 15 mms., and is therefore not noticed in the stools by the patients. The ova are also often rather scarce, and can be easily overlooked. It is usually taught that the tinea nana may or may not cause symptoms. I believe, however, from my own experience, that symptoms are always present, but that they are often overlooked, or attributed to something else, especially chronic appendicitis. The other tinea infections are usually diagnosed by the patients, who find the segments in their stools and come to the physician for treatment. They are also usually said not to cause any symptoms, but often do cause them.

The varieties of round worm are more numerous than those of the tinea. The ascaris lumbricoides, or common round worm, is probably the most familiar to the general practitioner, because it is the only one which can be seen with the naked eye. It is not however, contrary to the usual impression, nearly so common as some of its smaller cousins. The hookworm, pin worm, and whip worm are all fairly common. The strongyloides stercoralis, which resembles the hookworm very closely, morphologically, and which is the cause of the so-called "Cochin China Diarrhoea," is not so common as the others, but is sometimes found unexpectedly. The symptoms ascribed to these round worms, excepting hookworm infections, are always very vague in the text-books. As a matter of fact, the ascaris infections are usually diagnosed by the patients or the patient's mother, and the others are not diagnosed at all. Several cases of intestinal obstruction from large collections of ascaris worms have been reported,[10] [11] however, and at least one case of obstruction to the common duct by a migration worm. The hookworm and the symptoms of hookworm infection have been so thoroughly advertised and described by the hookworm commission and others, that I shall not spend any time on it. It is sufficient to say that it is very common in this part of the country. I shall report later, however, several very intersting cases (mistaken for malaria at first), in which the diagnosis was cleared up by the discovery of hookworm infection. The pin worm is comparatively common. Contrary to general impression, it is usually found in the small intestine, the cecum and appendix, rather than in the lower intestine. In severe infections, it may travel down

to the anus and be detected there if searched for, but usually it is not found in the stools unless driven down by an active purge (as described later) and even then a careful search is necessary to find them. The ova are usually very scarce, and in my experience, the worm is often found first, although occasionally the diagnosis may be made from the ova. It has now been pretty thoroughly demonstrated that both the pin worm and the whip worm, which I shall describe next, are often the etiological factors in attacks (12-17 inc.) of acute and subacute appendicitis, and that they probably lay the foundations for some attacks of suppurative appendicitis, since they are certainly an irritant to the mucosa, in which they are often found buried, and where they often cause small hemorrhages and ulcerations. The whip worm, or tricocephalus dispar, is often found along with the pin worm in the intestine of man. Why a double infection should occur so often is not known. It is small, about the size of the pin worm, and derives its name from its whip-like tail. The eggs are characteristic, and are easily recognized. It is usually taught that they cause no symptoms, but this is probably not true.[19] Garin,[18] of Paris, France, reports a series of cases in which it was the etiological factor (according to him), of acute appendicitis, enteritis, intermittent diarrhoea, headache, convulsions, vomiting and blood in the stools. It has also been reported in numerous inflamed appendices, removed at operations. (16, 12, 14, 15).

Reindorf (Med. Klin.)[14] reports several cases of pinworms in appendices removed at operation. He describes some of the symptoms caused by them and suggests that any case showing symptoms of so-called sub-acute appenditicis should be examined carefully for worms before operation; and he even goes so far as to say that vigorous vermifuges should be administered on suspicion in these cases, even in the absence of demonstrated ova, before an operation is advised.

Ashoff (Med. Clin.)[15] has given the name "Pseudo Appendicitis ex Oxyure" to these so-called sub-acute appendicitis cases, and although he does not agree with Reindorf in all of his teachings, he believes that they are a frequent cause of sufficient irritation to the colon and appendix to simulate a picture of appendicitis.

Before leaving the subject of pin and whip worms I wish to emphasize that both infections but especially pin worm infection, are often difficult to diagnose in the laboratory, due to the paucity of their eggs, and I wish to mention one method which will often enable one to discover the infection. This is the administration of a mild vermifuge followed by a saline purge. An examination of the stools following the purge is then made. and the parasites or ova are frequently found where none were present before (cases 27, 29, 30).

As mentioned above, it seems not unreasonable to suppose that all of these parasites cause some symptoms, which are usually either unnoticed or are attributed to some other cause, and, unless the worm is large enough to be noticed by the patient, the infection is never diagnosed. Bearing in mind this possibility, I determined some two years ago to examine as closely as possible all patients who fell into my hands, with the idea of detecting parasitic infection, if such existed. As physician and pathologist to the Southern Pacific Hospital of Houston, I was fortunate in obtaining an abundance of material with which to work.

At the outset, in order to determine what percentage of apparently healthy men were infected with parasites, we made a routine examination of 200 patients, mostly surgical cases (injured), for parasitic infections in the stools. As a result we found that, excepting amoeba coli infections, of which there were a large number, 7½ per cent were infected with some form of parasite. The men examined were mixed as to race, however, being about equally divided between whites, Mexicans and negroes. It was soon found that the negroes seemed to be comparatively immune to para-

sites, with the exception of amoebic infection (to which they seemed fairly susceptible). The Mexicans, on the other hand, seem to be very susceptible to all forms of parasitic infection, harboring amoebae and hookworm, especially often. The whites fell between the negroes and Mexicans as to the percentage of infections. The percentage according to race, therefore, was somewhat as follows: Mexicans, about 10 per cent; whites about 5 per cent; negroes about 2 per cent.

The relative frequency of the different kinds of parasites is best brought out by the subsequent work. This work was based on a study of some 1,500 patients, extending over a period of about two years, in which especial attention was paid to the possibility of parasitic infection. It was found that the hookworm was the most common parasite (excepting amoeba coli), with amoeba hystolitica coming next; then the dwarf tape worm, the tinea saginata, the pin-worm, the whip-worm and the strongyloides stercoralis, in the order named. To our surprise we did not find a single infection with ascaris lumbricoides in this series. It is worthy of note, also, that among about 500 negroes examined with this point in view, we found not a single case of hookworm infection.

The number of men who were disabled by parasitic infection, and the relation of disability from such infection to disability through other well-known diseases, was also of interest. There were about 1,500 cases admitted to the medical service of the S. P. Hospital during the period of observation. All of these were sufficiently disabled to cause them to give up their work, although by no means all of them were confined to bed. Omitting syphilis and gonorrhoea as causes of disability among these men (venereal diseases were not admitted), the following diseases were the more important causes of disability:

Tuberculosis comprised. 10% of med. admissions.
Malaria comprised ..... 9% of med. admissions.
Influenza comprised ... 4% of med. admissions.
Bronchitis comprised .. 3% of med. admissions.

INTESTINAL PARASITES comprised 2.9% of med. admissions.
Appendicitis comprised. 2% of med. admissions.
Typhoid comprised ... 1.5% of med. admissions.
Pneumonia comprised 1.8% of med. admissions.
Nephritis comprised .. 2.1% of med. admissions.

About .8 per cent of the parasitic infections were complicated by some other disease, making a percentage of about 2.1 uncomplicated infections. It can be seen, therefore, that intestinal parasites probably compare favorably with diseases such as typhoid, pneumonia, appendicitis, etc., as a cause of disability to the laborer, and as a source of economic loss.

And now we come to the part of the work which has interested me more than any other, because I believe that it has been least investigated, and because it seems to me that if this phase of parasitology were studied more carefully, by physicians in general, we would soon have some valuable clinical material with which to work.

A review of the history records of these patients brings out some interesting points, which can perhaps be more readily made out by reference to the protocol which I have prepared. I wish to say a word here, however, as to the taking of histories which form the basis of this chart. The histories were all, with a few exceptions, taken by the medical interne immediately after the patient was admitted to the hospital, and before parasites were suspected or looked for. The physical examination was made in like manner, a few notes being often added by myself, however, during the morning rounds.

Paying particular attention to the complaints of these patients, excluding those suffering from amoebic dysentery, we find that a large number of them complained of pain in the abdomen, and that this complaint is especially striking in those suffering from infection with hymenolepis nana (100 per cent of five cases), hookworm (seven out of eighteen cases), pinworm (two out of three cases) and whip-worm (one out of three

cases). This abdominal pain which was often if not usually given as the complaint, was usually described as colicky, and as coming on at irregular intervals of from several weeks to several months, not having any relation to eating, and as occasionally being accompanied by nausea or vomiting or fever. The pain was seldom severe. A number of these patients showed a certain amount of abdominal tenderness, especially on pressure over the right lower quadrant. In one case of hymenolepis nana infection, the tenderness seemed to follow the whole course of the colon. Two very interesting cases under our observation had been diagnosed as chronic appendicitis. Operation had been advised in both cases. No stool examination had been made in either case. Both were apparently cured by appropriate medical treatment. (Cases Nos. 19 and 27.)

Two very interesting cases of hookworm infection were observed. Both of these simulated malaria very closely, and would undoubtedly have been diagnosed as such had not blood and stool examinations been made. (Cases 2 and 8.)[22]. Malaria was also suspected in another case (No. 12). None of these patients showed any sign of return of trouble after treatment with thymol, and Case No. 8 has passed the first spring in several years without having chills and fever, which have always been attributed to malaria previously.

Two very obstinate cases of diarrhoea, one of five years' duration, the other of several months only, both weak and somewhat anaemic, proved to be heavily infected with strongyloides stercoralis. (Cases 33 and 34.)

We have observed one case, a girl, who had a triple parasitic infection with whip-worm, pin-worm and hymenolepis nana. (No. 37.)

One interesting case of tinea soleum has been observed in this series. The patient was a young German laborer, 20 years of age, recently arrived from Germany. He was admitted to the hospital with a temperature of 101, respiration 40, pulse 120. Great pain in upper epigastrium and lower right axilla. Muscular rigidity. Two chills. An eosinophilia led to an immediate examination of the stools, which were found to contain numerous ova of a tenia, which, on being expelled, proved to be tenia soleum.

I should like to mention several points which have been of great service to us in detecting intestinal parasites. We have found an increase in the eosinophile count of the blood in a vast majority of our cases, and, as a matter of fact, have first begun to suspect parasitic infection in quite a number of cases after discovering an unexplained eosinophilia. The eosinophilia is of no assistance, however, in cases of amoebic infection, nor is an eosinophilia invariably present with infection from other parasites, as cases Nos. 2, 26, 28, 30 and 31 will show. It has been claimed by Schloss,[2] of New York, that there is a relation between the eosinophilia and the symptoms in parasitic infection, he claiming that eosinophilia is present only when symptoms are present, but we have not been able to make out such a relation constantly in our cases.

A process which has been of great assistance to us in detecting ova, and the parasites themselves, in the stools, has been the antiformin-ether method of Yavita, described first by Yavita,[20], and later reported by myself.[21]. This method is, in my experience, much superior to any other for extracting ova, and is especially valuable in studying liquid or semi-fluid stools.*

Another point which has been of great value in detecting parasites has been the administration of one or more small doses of santonin and calomel followed by a saline cathartic in an hour or so. After this prelimi-

*The Yavita method consists in adding from 5 to 10 c.c. of 25 per cent antiformin (amount depending upon consistency of stool), mixing thoroughly, warming, adding equal amount of ether, shaking well, filtering through one layer coarse gauze, centrifuging 1 to 2 minutes (water centrifuge). Four layers are formed. Ova are found in the bottom layer.

nary treatment, the suspected stool, obtained when the salts acts, is examined for ova or parasites. We have been able to find parasites by this method where none were found previously after several stool examinations. (Cases 22, 27, 29 and 30.) And, finally, one negative stool examination is not sufficient to rule out a parasite infection.

In conclusion, several facts have been impressed upon us by this work:

First: Indefinite and unexplained abdominal pains or tenderness should make one suspicious of intestinal parasites. Parasites should be suspected in all cases of "chronic or subacute appendicitis."

Second: The adult negro is practically immune to hookworm infection, apparently, in this part of the country.

Third: Many apparently normal men, who harbor parasites, are subject to certain indefinite complaints, diagnosed usually as "indigestion," "cramps," "biliousness," "mild diarrhoea," "malaria," "febricula," "grip," etc., which are really symptoms of the parasitic infections.

Fourth: An otherwise unexplained eosinophilia is good evidence of parasitic infection, even though the parasites are not discovered at the first stool examinations, but an absence of eosinophilia does not rule out parasitic infection.

Finally, I wish to thank Dr. R. W. Knox, Chief Surgeon of the Southern Pacific Lines, for permission to pursue and encouragement in this work.

INFECTIONS WITH INTESTINAL PARASITES OBSERVED DURING 1913 AND 1914.

UNCINARIA INFECTIONS.

1. Farmer, aet 30; comp. stomach trouble, belching, fullness after meals, weakness. Occasional cramp-like pains. Eosinoph. 8 per cent.

2. Brakeman, aet 18. Fever, chills, typhoid suspected. No eosinoph.

3. Mex., aet 40, laborer; comp. weakness, R. B. C. 2,100,000, eosinoph 10 per cent.

4. Bkmn. wh., aet 23; pain in abd., gen. abd. tenderness, slight fever. Eosioph.

5. Mex. lab., aet 26; pain in back and stomach, weakness, anemia, eosinoph 8 per cent.

6. Clerk, wh., aet 19; pallor, weakness, abdominal colicks, anaemia, eosinophilia 6 per cent.

7. Mex. lab., aet 26; pain in back, weakness, wasting, marked anaemia (pernicious anaemia suspected). R. B. C. 1,900,000. Eosinoph.

8. Girl, aet 19; (pvt. pt) chill, fever, pain in abd., malaria suspected; several similar attacks; eosinoph. 18 per cent.

9. Mex. lab., aet 40; weakness, diarrhoea, bloody stools, loss of wt., eosinoph.

10. Dr. S.; pain in rt. side, belching, tenderness below rt. cost marg. Gall stones suspected, eosinoph. 5 per cent.

11. Fireman, aet 22; malarial organisms found, eosinoph.

12. Fireman, aet 21; chills, fever, headache, malaria suspected, eosinoph.

13. Mex. lab.; bronchitis, fever, headache, eosinoph.

15. Mex. lab., pulm. t. b., pain in abd., fever, loose bowels, tenesmus, eosinoph.

16. Mex. lab., 19; weakness, dizziness, fainting, inability to work, anaemia slight fever eosinoph.

17. Clerk, 19; dizziness, weakness, anaemia, eosinoph. (Hb. 55 per cent.)

17a. Mex., aet 41; weakness, eosinoph.

17b. Mex., 23; broken arm, anaemia, eosinoph.

HYMENOLEPIS NANA.

18. Mex. lab., 22; comp: stomach trouble; pain in abd. after meals, tenderness over rt. lower abd., eosinoph.

19. Mechanic, wh., aet 30; comp.: pain in stomach, colicky, occurring at irreg. intervals, tenderness over whole colon, esp. rt. lower quadrant. Entered with diagnosis of chronic appendicitis for operation. Apparently cured. No eosinophilia.

20. Clerk, aet 23; comp.: pain in stomach, weakness, slight gen. abd. tenderness, eosinoph.

21. Priv. pt. girl, wh., aet 12; pain in stom., cramps, pallor weakness, retarded development, blepharitis, eosinoph. (Heavy infection.)

22. Priv. pt. school girl aet 17; comp.: periodical attacks of "indigestion," consisting of pain in stomach, occasional vomiting, excessive appetite; eosinoph. 12 per cent. (Slight infection.) "Convulsions" as child (7-10 yrs.).

TINEA SAGINATA.

22b. Boy, aet 16; indigestion, tenderness, slight eosinpholia.

23. Negro; eosinoph. 5 per cent, no sypmtoms.

24. Mex.; no symptoms elicited.

25. Boy, wh., aet 12; retarded growth, poorly developed, cramps, segments seen.

26. Fireman, wh., aet 31; abdominal tenderness, cramps, segments seen. No eosinoph.

(Pin Worm.) OXYURIS VERMICULARIS.

27. Priv. pt. girl, aet 8; nervous, restless at night, colicks (called appendiceal by several physicians) at intervals of from several weeks to several months for past two years; operation advised several times. Slight eosinoph. (4 1-2 per cent). Apparently cured by medical treatment (8 mos.).

28. Priv. pt., farmer, 28; nervousness, sleeplessness, pain in back, weakness, no eosinoph.

29. Clerk, 19; comp.: stomach trouble sleeps poorly on account of "peculiar feeling in stomach," nervous, loss of weight, eosinoph. 8 per cent. "Colicks" several years ago.

WHIP WORM.

(Tricocephalus Dispar.)

30. Mex. lab., comp.: pain in stom., heartburn, occasional attacks of abdominal pain accompanied by vomiting and fever during past year, slight tenderness in right lower quadrant. No eosinoph.

31. Mex. lab., 28; comp.: stom. trouble, pain in abd., slight tenderness rt. lower abd., no eosinoph.

32. Neg. lab., comp.: stom. trouble, fullness after meals, belching, no colicks. Slight tenderness rt. lower abd., no eosinoph.

33b. Boy, aet 18; loose bowels, abdominal tenderness.

STRONGYLOIDES STERCORALIS.

(Cochin China Diarrhoea.)

33. Carpenter, wh., aet 35; diarrhoea (5 to 15 stools) for past 5 years, no blood, wasting, weakness, eosinoph. 40 per cent.

34. Priv. pt., barber; bloody diarrhoea, 6 mos. duration, wasting, weakness, dermatitis backs of hands, pains in legs, alcoholic, eosinoph. 10 per cent.

LAMBLIA INTESTINALIS.

35. Mex., aet 46; slight diarrhoea, 2 weeks' duration; no blood; no eosinophilia.

36. Mexican; mild diarrhoea; 3 days, no blood; no eosinophilia.

CERCOMONAS-HOMINIS.

37, 38. Mexican laborers, brothers; bloody diarrhoea; duration 2 weeks; tenesmus. No eosinophilia.

39. White, aet 51; carcinoma ventriculi.

40. White; pellagra.

41. White; pellagra.

MIXED INFECTIONS.

42. (Hymenolepsis nana, pin worm, whip worm). Girl, aet 10; comp.: "Cramps in stomach." Cramps have occurred at intervals of from several weeks to several mos. for two years. Vomits occasionally with attacks, tenderness rt. lowar quadrant. Eosinophilia 7 1-2 per cent. W. B. C. 10,000.

43. Mexican, aet 19; hook worm, hymenolepis nana. Comp.: weakness, hist. of colicks, slight tenderness (general). Eosinophilia.

TINEA SOLIUM.

44. German mechanic, aet 22; past hist, negative; complaint: "Pains in stomach." Great abdominal tenderness, especially in rt. upper quadrant. Two chills on successive days. Temperature when first seen 101; pulse 120; resp. 40. W. B. C. 11,000. Eosinophilia 5 1-2 per cent. Stools: Numerous, tape-worm ova. After strong vermifuge a typical tinea solium was recovered. Pt. discharged apparently well 1 week later.

TABLE SHOWING DISTRIBUTION OF SYMPTOMS ACCORDING TO INFECTION.

	No. of cases	Eosinophilia (over 4%	Anaemia (marked)	History of Colics	Abdominal tenderness	Fever	Chills	Indigestion	Diarrhoea
Hookworm	19	18	9	6	4	5	2	2	2
Tinea nana	6	5	1	6	4	1	1	2	0
T. saginata	4	3	0	2	1	0	0	0	0
Pin worm	3	1	0	2	1	0	0	1	0
Whip worm	4	0	0	2	3	1	0	1	0
Strongyloides	2	2	1	0	2	0	0	0	2
Lamblia	2	0	0	0	2	0	0	0	2
Amoeba hyst.	16	0	0	0	12	4	0	0	13
Tinea solium	1	1	0	1	1	1	1	0	0
Cercomonas	4	0	0	0	0	0	0	0	2
Amoeba coli	58	0	0	0	0	0	0	5	4
Mixed (whp worm, pin worm, and hymenolepis nana	1	1	0	1	1	1	0	1	1
Mixed (hookworm and hymenolepis nana	1	1	1	1	1	0	0	1	0
Mixed (amoeba coli and amoeba hyst.	4	0	0	0	4	1	0	0	4

TABLE SHOWING DISTRIBUTION OF PARASITES ACCORDING TO RACE.

	No. patients observed	No. cases hookworm	Tinea nana	Whip worm	Pin worm	Amoeba hystolitica	Amoeba coli	Tinea saginata	Tinea solium	Strongyloides stercoralis	Lamblia	Cercomonas
White	630	9	5	1	3	4	18	2	1	2	0	0
Negro	456	0	0	1	0	4	10	1	0	0	2	2
Mexican	416	10	1	2	0	8	20	1	0	0	0	2

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DISCUSSION.

Dr. Randolph Lyons. New Orleans: I want to compliment Dr. McNeil on his very interesting paper. I hardly think that there is anything I can add to it. I agree with him that a systematic examination of the stools is a much neglected field, particularly by the average general practitioner. Emphasis should be put upon examination of the fresh stools, particularly by the practitioner, because many more facts can be gleaned then than from a stool kept for many hours. Motile organisms, such as amebae and various flagellates, etc., are more easily recogniged by men who have not had much practice when the fresh stools are examined than in those cases where the stool has been kept a long time, as these organisms become encysted. In the encysted form they are difficult to diagnose unless you have had considerable experience. The symptoms produced by a number of intestinal parasites are often so vague that it is usually impossible to make a diagnosis without stool examination. A good rule is to examine the feces of all individuals complaining of abdominal discomfort or bowel disturbance. The incidence of intestinal parasites, as shown by Dr. McNeil, in Texas, is not the same in Louisiana. We have, I think, a far higher percentage of hookworm infection. The examination for hookworm made on the medical students by Dr. Bass some years ago showed a much higher percentage. Also, our percentage of cases of amebic dysentry is considerably higher than the one given here. It is apparently more prevalent in our section of the country and is the most common form of dysentery we have. Bacillary dysentery is comparatively rare.

In regard to the symptoms caused by flaggellates and their pathogenicity, there is still some question. Many observers, however, do not believe that the flaggellates are pathogenic. It would seem, at least, as if most of these parasites cause trouble only when a person is taken sick with an acute infectious trouble, or something which will lower his resistence, and these organisms then become active and complicate the clinical picture by producing diarrhoea. This is particularly true of strongyloides intestinalis, which is not an uncommon parasite with us.

When we come to the question of the pathogenicity of the ameba coli, I only remember two cases in which I suspected that particular organism had anything to do with the diarrhoea. We found it associated with the pathogenic ameba, and when we got rid of the pathogenic ameba, the ameba coli gave no further trouble, though it still persisted in the stools. Amebae cause trouble chiefly by penetrating the tissues. As long as they remain in the intestinal tract and do not attempt to penetrate the mucosa, they may be considered outside the body and give rise to practically no symptoms. Even pathogenic amebae, if they do not get into the tissues, cause no trouble, but when they enter the tissues or remain encysted within them, we have symptoms of varying degree.

The information obtained by examination of the feces is as important to the surgeon as to the internist. The surgeon should hesitate before operating on abdominal cases, if possible, until examination of the blood and stools have been made, and particularly the fresh stool.

Dr. H. L. McNeil, Galveston, Texas: I did not mention the nervous symptoms in this series of patients because such symptoms did not play any large part in the series. Possibly this is due to the fact that most of the cases were among adults. As is well known, the nervous symptoms are often present in children.

The particular point which has impressed me in this work are the periodical attacks of abdominal pains, associated often with some degree of abdominal tenderness, and due, possibly, to a colitis, or to an irritation in the appendix. Moreover, this train of symptoms seems to be more common in the infections with the smaller worms than it does with the large ones, and the hymenolepis nana seems especially liable to cause such symptoms. I would also suggest that in cases of chills and fever in which no malarial plasmodia can be demonstrated in the blood, the stools be examined more frequently.

SANITARY MARKETS.*

By Mosby G. Perrow, Ph.D.,
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Lynchburg, Virginia.

One of the most important problems engaging the attention of the real sanitarian is the problem of seeing that the public is supplied with wholesome food at the lowest cost. No hygienic regulation can be of much value with an impure or an excessively costly food supply. Food and water are the very foundation of all health work, and no health department measures up to its full duty that neglects careful attention to either.

By pure food I do not mean merely the precaution that all injurious preservatives such as boric and salicylic acids are eliminated, which certainly should not be allowed, or benzoate of soda, either, for that matter, but that foodstuffs shall be prepared and stored in clean surroundings and kept in the condition that is best adapted to their wholesome preservation until they are delivered to the consumer.

A visit to almost any municipal market will disclose a situation that causes the ordinary eye to seek elsewhere for a resting spot. The place is usually a feasting ground for flies and a haven of refuge for rats. No one in particular seems to worry about the matter. The market has always been so, is the general view, therefore so it must remain.

*Read in the Section on Public Health, Eighth Annual Meeting, Southern Medical Association, Richmond, Va., November 9-12, 1914.

Interior view beef dressing department.

In Lynchburg, Va., an attempt has been made to improve matters to some extent. A careful study was made of private markets and storage places for foodstuffs in different sections of the country. No public market visited was found worthy of study, save in observing what to avoid. A plan was formulated involving the application to the public market of some principles which were utilized in private markets.

In short, the main feature of the plan was to install a mechanical refrigerating plant for the entire market, and this plan has been put into effect. At each butcher's stall is a refrigerator built of white enameled brick with proper insulation and large enough to hold all of the dealer's meats, which are cooled with mechanical refrigeration. Electric power is used. In front of the stall the glass show case counters are equipped with coils and are

Former Charlottesville, Va., slaughter houses.

Interior view hog dressing department.

likewise chilled. Thus all the meat, save what is being cut up, is not only protected from dust, flies and rats, but is kept in dry cold air, that is, in ideal conditions until sold to the customer. The temperature is regulated by thermostat and is set for 35-40 degrees Fahrenheit, which temperature is maintained automatically the year round, July and January. Of course other foodstuffs requiring cold are preserved from the same plant, with the exception of fish. Mechanical refrigeration as is well known is too dry for fish and ice is substituted for them. The market is an inclosed one with concrete floor drained so that it can be flushed with hose.

The market has served to give not only a clean and economical storehouse for the distribution of foods, but what is of as much or more importance, it has served as an object-lesson in demonstrating how to keep foods, especially meats. Instead of breeding, it excludes both flies and rats. As we all know, flies and rats are two of our arch enemies, against which war is at present being waged to the death by sanitarians. Such markets are formidable weapons in the attack on both.

The real reason for the warfare on flies is to prevent their access to foods. Such a market in large degree secures this relief. A necessary part in the campaign for the reduction of rats is to exclude them from what they feed on. Such a market also to a great extent meets this necessity. No successful fight can be maintained against rats unless foodstuffs are securely protected.

The total cost of the building and the equipment of this market, not counting lot, was $62,000. The city auditor reports for one year the total income was $10,342.51, expenses $3,580, net income $6,462.51. A very fair dividend, all things considered, especially when it is borne in mind that the money dividend to the city was the least consideration.

As suggested above, the outside effect is more important than even the market itself. Practically every butcher and dealer in the city outside the market has equipped a plant modeled on the municipal market, and without exception is pleased at the economy over old methods, at the increased sales, at the high state of cleanliness, and at the reduced labor of operation. One butcher who does about a $60,000 business, stated to me the other day that he saved by mechanical refrigeration at least $200 per month, but if he

Present modern abattoir at Charlottesville, Va.

didn't save a cent, nothing could induce him to return to the old methods. He would go out of business first. This is about the opinion expressed by all.

Another matter which has nothing to do with a market house, but which is a very essential part of any market in the broad sense, is securing a safe butter at a reasonable cost. While milk has received a great deal of attention from health experts, scant thought has been given to butter. General attention has been so concentrated on milk that we have well nigh forgotten butter, although butter will harbor bacteria, for example tubercle bacilli, for weeks, much longer than will milk.

Interior view beef and hog cooler.

Interior view sausage kitchen.

Butter in the South in the average city is supplied largely from farms. These farms would not be permitted to sell milk owing to lack of sanitary conditions, but no legal obstacle has been interposed so far against their selling butter. It would not be advisable at present to cut off the sale of this butter, and yet there is no question but that it is dangerous. The remedy adopted in Lynchburg was to allow the creameries to purchase cream from barns not sanitary on condition that the cream be pasteurized. By pasteurizing the butter is made safe, and butter of better flavor is obtained by creamery methods. The creamery butter will displace most of the country butter owing to its superiority. When once the farmer sells to the creamery a line can be gotten on him and he can be more easily taught the importance of cleanliness. Do not understand me to say that I advocate unsanitary cream for butter. I believe in the strictest sanitation, but much if not most butter used in the South today comes from unsanitary farms and the urgent need is to see that this butter is first made safe and then go in for improvement in general sanitation. We have followed this method in Lynchburg, and now most of our butter is from the local creameries, and all of the cream is pasteurized and comes mainly from dairies with greatly improved cleanliness both in methods and equipment.

DISCUSSION.

Dr. Roy K. Flannagan, Richmond, Va.: As one of the officers of the Virginia State Board of Health, it has been my privilege to visit the market house described by Dr. Perrow. I wish to say that it is all he claims for it. Dr. Harvey W. Wiley says, too, it is the most sanitary markethouse he has ever seen. It is, however, not only sanitary but a paying proposition for the city.

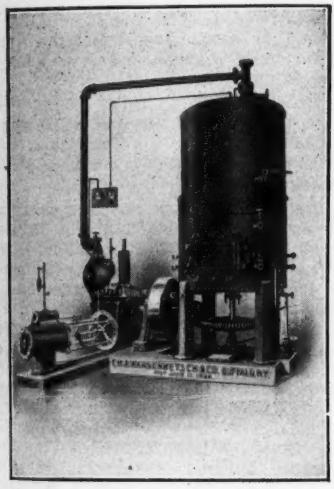
In connection with this discussion, I would like to call attention to an antecedent of the meat market that deserves the attention of health officers here in the South, namely, the "slaughter house."

A few years ago in the town of Charlottesville, Va., (about 7,000 people) a movement was started looking towards improving the meat killing places

around the town. Dr. McCormack, the father of Dr. A. T. McCormack here, was called in to help arouse public sentiment, and he did it to the queen's taste.

He visited all of the slaughter houses and made observations. A meeting of the city council and the physicians was then called and the whole odorous matter laid before them. Nothing, however, seemed likely to come of it, until the owners of the local ice plant were approached and asked to investigate the possibility of establishing a sanitary abattoir in connection with the refrigerating plant. The matter of cost was gone into and it was learned that for fifteen thousand dollars a satisfactory plant could be built.

A stumbling-block was then discovered in the city ordinance forbidding a slaughter house within a quarter of a mile of the corporate limits. Several members of the council, notably one member of the Board of Health, refused to sanction the building within the city. It is, I may say, essential to the successful working of a place of this



Sanitary combination rendering and drying apparatus.

sort that it be in juxtaposition to an ample refrigerating apparatus and accessible to the meat dealers. To convince these councilmen it was only necessary for the health officer to take them driving over the territory so lately covered by Dr. McCormack. The smells and the buzzards hovering round easily demonstrated the necessity for action, and the necessary permission to build was granted at the next council meeting, proper safeguards being taken for health department supervision. The construction was at once undertaken and as the work progressed the promoters decided to make the plant first-class in every particular, $45,000 being the final cost. The abattoir today is killing all of the meat of the city and in addition has now attached to it a splendid meat-packing plant, which is operating to full capacity and readily disposing of all its products. The whole enterprise is successful from every point of view. This ought to point the way to municipally owned sanitary abattoirs as well as sanitary municipal market houses.

Dr. McCormack (addressing Dr. Seale Harris, the Secretary): Doctor Harris, would it not be possible to make photographs of that abattoir and of that sanitary market house for publication in the Journal?

(Editor's Note: The cuts illustrating this paper were furnished us through the courtesy of C. H. A. Wannenwetsch & Co., 563 Williams St., Buffalo, N. Y., who equipped the sanitary abattoir mentioned in this discussion.)

AUTHORS' ABSTRACTS.

Tropical Diseases and Public Health.

The Propagation of Amoebic Dysentery in Animals and the Recognition and Reproduction in Animals of Atypical Forms of the Disease. By Andrew W. Sellards and Walter A. Baetjer, Baltimore, Md. American Journal of Tropical Diseases and Preventive Medicine, 1914, II, 231.

Amoebic dysentery was produced in lower animals with unusually constant results (practically 100 per cent) by direct injection into the cecum, after its exposure by an exploratory laparotomy. Infection was secured even when the injected material was poor in amoebae and contained only atypical forms. This result is in marked contrast to the usual methods of inoculation, which give only about 50 per cent of infections. With the aid of this procedure continuous propagation of a typical strain was secured, whereas the current opinion maintains that sub-inoculation is limited to three or four passages. In typical amoebic dysentery no evidence was obtained from the infected animals that the entamoebae can produce death primarily by their own action, but when death occurred it was always due to a bacterial septicaemia. There is strong evidence to indicate that a fatal bacterial septicaemia may develop in acute cases in man.

Some diarrheas of obscure origin were studied. In one of these the clinical diagnosis of syphilitic proctitis seemed justifiable. In another case a giant colon had developed and the anatomic conditions appeared to be sufficient to account for the diarrhea. A few atypical amoebae occurred in these cases and animal inoculation proved that they were the aetiologic factor. Absolute identification of these atypical amoebae was not possible, but, for the present, the authors prefer to regard them as atypical strains of **E. histolytica** until further information is available.

The Purity and Strength of Household Remedies. By Martin I. Wilbert, United States Public Health Service, Washington, D. C. Public Health Reports, January 29, 1915.

It is asserted that the loss of human energy through morbidity and mortality by preventable diseases constitutes by far the greatest waste of our present day resources and that it is not generally appreciated that this waste is due either to neglect or ignorance so far as the use of prophylactic or curative measures may be concerned.

The variability of drug action due to differences in the strength and purity of the several drugs or preparations is thought to be due to the fact that state food and drug laws and the laws designed to regulate the practice of pharmacy and to restrict the distribution of potent medicines to specially trained and capable individuals are not effectively enforced.

A table presenting a compilation from the reports of state chemists shows that 3,472 samples of ten official articles that are widely used as household remedies, examined in 1913, 1,259, or 38 per cent, were rejected as being adulterated or not in compliance with the official requirements.

A second table shows that of 5,347 samples of the same articles examined during 1912, 1,861, or 35 per cent, were rejected.

The preparations included in these tables are more frequently used as household remedies than on the prescriptions of physicians, but are, nevertheless, recognized medicines, the abuse or misuse of which may lead to serious consequences.

The author concludes that a more energetic and active control of all drugs and preparations is needed.

Occurrence of Yaws in United States. By E. J. Wood, Wilmington, N. C. American Journal of Tropical Diseases and Preventive Medicine, January, 1915.

The importance of this article lies in the fact that yaws has occured in a white child never out of North Carolina, and it may be that, like pellagra was, it is being overlooked. The writer refers to an interesting article by John Brickell, M.D., a Dublin physician, who was an emissary to the Cherokee Indians. This writer described yaws accurately in North Carolinians and the work was published in 1737. The probability that yaws is being called syphilis in the negro is emphasized and the suggestion made that this may account for the relative infrequency of tertiary manifestations.

The work of Capt. H. J. Nichols on the study of the treponema pertenue, which is now known to be the causative agent, is carefully detailed. The difficulties encountered by investigators in distinguishing between T. pertenue and T. pallidum receives special mention.

The chronological bibliography of J. Numa Rat is published with numerous additions and brought up to date. This will serve to aid any who may care to look further into this interesting subject.

Some Facts and Discoveries Concerning the So-Called Continued Malarial Fever. By J. H. McCurry, Grubbs, Ark. Memphis Medical Monthly, February, 1915, pp. 62-65.

The common cold or retention of an abnormal amount of toxic elements in the blood cause more than half the ailments we treat. A piece of iron is shorter when cold than the same piece of iron when hot, caused by cold contracting the pores. The same is true in regard to the skin, there is a drawing and contraction of the skin caused by exposure and chilling of the body, this rendering the dermal glands inactive and somewhat closing, and preventing the blood from unloading the dead cells, poisonous gases and toxic compounds through the skin.

In every case of this fever I have ever treated I have found all the unmistakable evidences of this complicating element present.

Quinine furnishes the best illustration known to therapeutics of a true specific. The proper prophylactic and hygienic precautions, coupled with the proper remedies and quinine given over a long enough period, will effect a cure in every case so far as malaria per se is cencerned.

If this was a malarial manifestation per se, quinine would destroy every available hematazoon within one week. If the cause of any trouble is removed, the manifestation produced by that particular cause will rapidly subside and a gradual return to the normal will result.

From close observation I am fully convinced that when in a fever we suspect malaria, even though confirmed by the microscope and hematozoa found in abundance resists the action of quinine for more than one week, we have some other condition present.

The Late Outbreak of Plague in Havana. By Aristides Agramonte, Havana, Cuba. American Journal of Tropical Diseases and Preventive Medicine, July, 1914, pp. 13-27.

The first cases of plague appeared almost simultaneously in Havana and San Juan, Porto Rico, and it was therefore surmised that both ports were infected from the same source, the Canary Islands, where the infection has taken root and, all evidence shows, remains in a more or less latent form. The Spanish authorities follow the method of concealment and deception with regard to plague, according to their own acknowledgment. Three cases of plague occurred in Havana in 1912 (June-July); active anti-rat measures instituted had to be suspended in June, 1913, for lack of funds. First case of second crop appeared in February, 1914; subsequently nineteen cases developed, and seven in Santiago, on the other end of the island. The measures which definitely suppressed this outbreak were mainly directed upon rat destruction, although much was done to rat-proof houses found honeycombed by rat burrows. Much fumigation by means of hydrocyanic acid gas was carried out, and to the lethal qualities of this gas is attributed the apparent success in the disappearance of the infection. At one time seventeen blocks of houses were vacated simultaneously and fumigated, mainly with sulphur. Some of the houses, in which plague appeared after fumigation, were again treated, but with hydrocyanic acid gas. No rat plague was found anywhere, except for two rats discovered in an old stable, which was destroyed by fire. The result of treatment by massive and intra-venous injection of plague antitoxine was demonstrated by the low death rate, compared with other epidemics; twenty-one cases with three deaths.

SURGERY, GYNECOLOGY, OBSTETRICS AND GENITO-URINARY DISEASES

CONSERVATIVE TREATMENT OF FRACTURES.*

By R. W. Knox, M.D.,
Houston, Texas.

The object of this paper is to discuss the indications for nonoperative as well as operative work on fractures, either with or without bone fixation by artificial means, and the treatment of serious compound injuries as usually found in railroad work.

The treatment of fractures has always been and bids fair to continue to be a fruitful topic of discussion among surgeons, with varying degrees and differences of opinion. It may be stated in this connection that where a multiplicity of ideas are advanced on the same subject the probability is that a perfect solution of the problem has not been found. If results are better by any one method it is only a question of time before its general adoption. It is, of course, expecting the impossible to hope that we will find a plan of treatment that will accomplish good results in all cases, although a greater unity of action among the profession on this important subject is greatly to be desired. Notable improvements have been made in recent years in the treatment of fractures, due to the more frequent use of the X-ray, better operative technique, bone plates of various devices, a better knowledge of the use of plaster splints and so forth. In making the change from the conservative to the more radical methods the tendency is to become biased in favor of the latter, when the real truth might be found in a discriminating selection of the one most suitable to the case in hand. The most earnest advocate in favor of the operative treatment of fractures is Mr. Lane, of London, who does the bone operation with fixation in nearly all of his cases. The secret of his successes in the adoption of one method to the exclusion of all others is his most painstaking and excellent technique. There is no question, however, but that some of his good results could have been accomplished as well without operation, and some of his bad results avoided in the same way.

The two all-important and axiomatic problems with every case of fracture are: First, the proper readjustment of the bone, and second, immobilization. It has been my experience as well as my observation that we often attempt to immobilize our fractures without positive knowledge that they have been properly replaced. It has also been my experience that bones properly set have, in the majority of cases, very little tendency to displacement if the limb and its adjacent joints are kept immovable by properly adjusted plaster splints. It is unfortunately the case that we have fractures that no amount of manipulation, however skillfully applied, can replace even under anesthesia. In some cases by our process of handling, often violent, we imagine a replacement but, on further investigation, find the bone has slipped out and the condition is the same as before our efforts at adjustment. It is a fair surmise to say that in nine cases out of ten the bone has never been replaced, or it would not have "slipped out." The failure of manipulation is by no means in the majority of cases the fault of the surgeon; it may be that there is an interposition between the fragments of muscle, fascia or tendon, or even small pieces of bone, or in the absence of these, to the very nature of the break itself. Bones are rarely fractured with smooth transverse surfaces; nearly always with deep serrated edges or with long spiculae attached to one of the fragments. When they have become entirely displaced and rotated from the

*Read in Section on Surgery, Southern Medical Association, eighth annual meeting, Richmond, Va., November 9-12, 1914.

original axis no amount of manipulation without ocular inspection can restore the original line of clearage. Such cases are not rare; in fact, form by no means an inconspicuous per cent of our cases. We have found that the only operation necessary in many of these is to open up the fracture, evert the bones and replace and apply a moulded plaster splint. Unfortunately, however, there are indications for the surgeon in some cases, and in certain bones, to make his choice between steel plates, bone pegs, bone grafts, nails, piano wire, etc. It is unnecessary to say, however, that this should be avoided where possible even in a well-regulated hospital, and where the surgeon has not the facilities for doing good work the more conservative plan of non-operation is best. Nature resents the presence of foreign bodies in a wound, and especially so when their introduction is attended by much handling of the tissues. It is on this account that our technique should be as nearly perfect as possible when compelled to use them. The femur is a notable exception among the large bones of the body which shows a marked tendency to displacement after fracture. This is due to the fact that it is a single bone with strong opposing muscular attachments. The upper portion of the femur shows the greatest disposition to displacement, due to the upward and outward traction of the upper fragment by the gluteal and psoas muscles. The old method of treating fractures in this location has not been a success. Occasionally the man will be found who claims brilliant results by his own methods of outward splint adjustment and traction, but the majority of earnest workers have met with disappointment in their use. I have tried the old as well as the new way but without any great degree of flattering results. The long steel bone plate will come nearer giving the proper support to the bone, if properly reinforced by external support. The long splint is not a sufficient adjuvant to the bone plate, as the leg cannot be kept immovable, due to the necessary handling of the patient. The leverage is exaggerated at the seat of fracture by the least movement of the leg, and a tendency to displacement and bending of the splint is very great. Another point in this connection is that union in this locality is so slow that the efficiency of the plate is lost before a union of the bone begins. I have had good results recently in a case of fracture just below the trochanter by enclosing the entire pelvis as well as both legs at a slight angle of abduction in a solid plaster cast after the bone plate had been applied. The result will not be so good if the uninjured thigh is not fixed in the same way as its fellow, due to the fact that the much to be feared angulation at the seat of fracture by the tilting of the thigh will cause displacement and bending of the splint. This arrangement of external and internal fixation has an advantage in allowing the patient to be wheeled into the open air in a reclining position at any time after the cast has hardened. In treatment of fractures of the femur, generally speaking, there is the greatest advantage in an accurate end-to-end approximation of the fractured bones. If the union is compelled to take place by a callus thrown between the ends, besides great shortening, convalescence is necessarily much prolonged. In such a case if the weight of the body, even after two or three months, should be carried on the soft callus, the shortening of the limb will tend to increase. In demonstration of the value of perfect end-to-end approximation I have recently had a case in the lower end of the thigh where bone plating was done on account of overlapping, and where the convalescence was very rapid, and no noticeable shortening. The most difficult by far of all cases, especially in railroad surgery, are the compound comminuted fractures of the large bones of the leg. The difficulty in handling is increased by the infection which is almost sure to take place. It is here that the bone plate and plaster cast seem contraindicated, and yet there is no alternative as to their use. We must maintain alignment of the bones and rigidity of the limb, not only for the comfort of the patient in the matter of dressing, or handling, but as an only hope for an ultimate successful union of the bone. With-

out infection in such cases I would hesitate to use the plate for fear of producing the same; if infection supervenes, plating is advisable. This statement is probably unorthodox, but my experience has been that better results are obtained by making the fractured ends rigid by a long bone plate extending well above and below the seat of fracture. All loose pieces of bone are removed, counter openings are made for drainage and for daily cleansing. If it is a fractured femur the wound is bridged by a steel splint incorporated above in a pelvic spica and below into a leg cast extending to the toes. Abundant space is left for drainage and irrigation. The leg can be handled without pain or the slightest movement at the seat of fracture. As the plaster and steel splint are put on with the leg extended it is held in this position of extension without danger of overlapping, even if the bone plate should become loosened. A model for the steel stirrup to be incorporated in the plaster can be made with a thin strip of aluminum and handed to a blacksmith for proper forging. The same general plan can be followed in compound fractures of the tibia and fibula. In this case, however, two steel stirrups, especially if the fracture is near the ankle, can be used, one on each side of the leg, and fastened to the sole of the plaster shoe below and to the plaster cast around the knee above. When infection has been checked and granulation has taken place the plate should be removed. It has been argued by some that a bone plate should not be used in an infected wound, yet I have found it answers a good purpose in keeping the bones in proper alignment until such a time when, by granulation around the wound, the bones show no disposition to become displaced. Union may not occur for some time after the bone plate has been removed, but a straight leg is the final result. If there is delayed union after the soft parts are healed a leg brace with plaster supports will greatly aid nature in her efforts at repair. I am also using the same plan for delayed union in simple fractures of the tibia and fibula. In my opinion this method is simpler and in many ways superior to the operations which are used to stimulate bony growth. This splint, of course, is only used for delayed union in fractures of the tibia which, in our experience, oftener occur than in any other bone of the body. In fact, at times union fails to occur even when the bones have excellent approximation. The ordinary rigid splint which is used for this purpose is of little value in these cases. We, therefore, have adopted the walking brace which allows a portion of the weight of the body to be borne directly at the seat of fracture. The irritation set up in this way soon stimulates bony growth. The plaster has the advantage of being an unyielding support, is very durable, fits well and can be made in any hospital in a very short time. The first case on which I used this walking brace was in a man sixty years of age with a spontaneous fracture of both tibia and fibula midway of the leg. It had been treated in the usual way but without the slightest effort at bone repair. As he was beginning to feel the effects of enforced confinement, he was put on crutches with the combination leg brace of plaster and steel (which I here show you), and allowed to walk. In six weeks he resumed his occupation as drummer without any artificial aid in walking, as bony union was firm and complete in both bones. Since that time I have used the same splint in all cases of delayed union of the leg with most excellent results, and I am inclined to think that it is better than the bone graft, which has been recently advocated as you avoid operation, and at the same time it allows the patient a much needed exercise. Since we have learned in our hospital how to handle plaster and make splints reinforced with steel for compound wounds we have obtained better results in both simple and compound fractures.

(Discussion on page 508.)

*TREATMENT OF UNUNITED FRACTURES.

By Hugh H. Trout, M.D.,
Jefferson Hospital,
Roanoke, Va.

We all have troubles, but no man is perplexed more than the surgeon who is called on to correct a large number of ununited fractures, and I personally believe the introduction of the Lane plate is largely responsible for the apparent recent increase in this class of cases.

This plate has unquestionably done a great deal of good, both in a negative and positive manner, for its advent has stimulated an immense amount of research work and doubtless in a number of cases it has served the purpose for which it was intended. On the other hand, however, it has tempted many a surgeon to employ it when far simpler and longer tried methods would have sufficed, and the placing of this foreign body in the wound has either prevented or certainly limited osteogenesis.

So great is the fear of infection by the originator of this plate as for him to insist it should not be touched with the gloved hand, but only with especially devised instruments. This, however, is not in keeping with modern technique, for certainly if a wound is to be aseptic, the gloved hand as well as the instruments must be surgically clean.

Having in mind, first, the dangers of infection in the presence of a foreign body; second, the dangers of infection with an autogenous bone graft; thirdly, the result of a foreign body placed in the epiphyseal line upon the future growth of that bone in its long diameter, and fourthly, the results of an autogenous bone graft placed in the epiphyseal line upon the future growth of that bone in its long diameter, we started a series of experiments on Belgian hares, and the results seem to justify our plea against the indiscriminate use of the Lane plate or any other foreign material.

Taking up the first two questions, namely, infections, we took a series of thirty-five (35) rabbits. The first five were injected with a culture of colon bacillus mixed with graphite. In this series we only obtained three abscesses but with these three we made an incision through the abscess to the bone and placed a small Vanadium steel screw in the femur. In all three the screws finally came to the surface and were removed in six, ten and forty-one days, respectively. With the rest of this series we gave up the idea of trying to develop a certain type of abscess and decided to simply make an incision in the rabbit's thigh in as dirty a manner as possible, and thus obtain an infected field through which to place our screws, and at the same time we obtained a culture to ascertain the type of organism producing the infection. This was carried out in thirty rabbits, with the following results: Six rabbits died from the anaesthetic (ether), leaving twenty-four which had screws placed in either tibia or femur. In two (Nos. 6 and 12) the screws remained in position after developing sinuses, both of which finally closed, and in the remaining twenty-two all the screws came to the surface and were removed.

This series, according to the type of infection, is as follows:

Bacteria Found in Rabbits Having Screws Inserted.

1. B. pyocyaneus and a few gram positive dipplococci.
*6. B. coli and a few gram positive dipplococci.
7. Staphylococci, streptococci and a gram negative bacillus.
8. B. pyocyaneous and streptococcus.
*12. Staphylococci, streptococci and gram negative bacillus.
13. Staphylococci, streptococci and a few gram negative bacilli, B. pyocyaneus.
14. B. pyocyaneus and staphylococci.
15. B. coli and staphylococci.
16. Staphylococci and a few B. pyocyaneus.
17. Gram negative bacilli and a few gram positive bacilli and cocci.
18. B. coli.
19. Gram negative bacilli and a few cocci.

*Read in Section on Surgery, Southern Medical Association, eighth annual meeting, Richmond, Va., Nov. 9-12, 1914.

20. B. pyocyaneus and a few cocci.

21. Staphylococci, streptococci, a gram negative bacillus, probably B. coli and gram positive bacilli.

23. Staphylococci, streptococci and a few B. pyocyaneus.

24. Gram negative bacillus, a few cocci and gram positive bacilli.

25. Staphylococci and B. pyocyaneus.

27. B. coli, B. pyocyaneus and a few streptococci.

40. B. pyocyaneus.

41. B. pyocyaneus.

42. B. pyocyaneus.

43. Staphylococci and B. pyocyaneus.

44. B. coli and B. pyocyaneus.

45. B. pyocyaneus and a few staphylococci.

We next determined to ascertain the fate of an autogenous graft placed through an infected field in the same manner in which we had inserted our screws. The manner of obtaining the graft was simply to remove a small piece of bone and transfer it to the other leg. In other words, to take from the left and place on the right, and from the right and place on the left.

In this series we employed twenty-five rabbits, three of which died from ether, leaving a series of twenty-two (22) rabbits having forty-four (44) grafts. Five (5) of the bone grafts worked out (Nos. 50-R, 55-L, 60-L, 81-R, and 87-R), while in the remaining thirty-nine (39) the grafts all apparently "took" and were found in place by X-rays and later on autopsies.

The grouping according to bacteria is as follows:

Bacteria Found in Rabbits Having Autogenous Grafts.

49. Right—B. coli, B. pyocyaneus and a few cocci. Left—B. coli and B. pyocyaneus.

50. *Right—B. pyocyaneus. Left—B. coli, B. pyocyaneus and streptococci.

51. Right—B. coli, B. pyocyaneus and a few gram positive bacilli, with metachromatic granules. Left—B. pyocyaneus.

52. Right—B. pyocyaneus. Left—B. pyocyaneus, B. coli and staphylococci.

53. Right—B. pyocyaneus and staphylococci. Left—B. coli and B. pyocyaneus.

54. Right—B. coli and B. pyocyaneus. Left—B. pyocyaneus and a gram positive bacillus.

55. Right—Staphylococci and B. pyocyaneus. *Left—B. pyocyaneus and a few cocci.

56. Right—B. pyocyaneus and a few gram positive bacilli. Left—B. pyocyaneus and a few gram positive bacilli with metachromatic granules.

57. Right—B. pyocyaneus. Left—B. pyocyaneus and a few gram postive bacilli with metachromatic granules.

58. Right—B. pyocyaneus. Left—B. pyocyaneus.

59. Right—B. pyocyaneus and a few gram positive bacilli with metachromatic granules. Left—B. pyocyaneus and a few staphylococci.

60. Right—B. pyocyaneus and a few gram positive bacilli with metachromatic granules. *Left—B. pyocyaneus and a few gram positive bacilli with metachromatic granules.

75. Left—A. gram negative bacillus. Right—Gram positive and gram negative bacilli and a few cocci.

76. Left—Large gram positive bacillus, gram positive dipplococcus and gram negative bacillus. Right—Staphylococci and gram positive and gram negative bacilli.

77. Left—Staphylococci, gram negative dipplococci and gram positive bacilli. Right—Gram positive bacillus and staphylococci and gram negative bacillus.

80. Left—B. coli, staphylococcus aureus and a gram positive bacillus. Right—Staphylococci, gram negative bacillus and dipplococcus and a gram positive bacillus.

81. Left—B. coli, gram positive dipplococcus and a few gram positive bacilli. *Right—Staphylococcus aureus and gram positive and gram negative bacilli.

87. Left—Staphylococcus aureus and gram positive bacillus. *Right—Staphylococcus and gram positive bacillus.

88. Left—Staphylococcus aureus, gram positive bacillus and gram negative dipplococci. Right—Staphylococcus aureus and gram negative dipplococcus.

89. Left—Staphylococcus aureus and a small gram positive bacillus. Right—Gram positive bacilli (white and yellow colonies).

90. Left—Gram negative bacillus and gram positive bacilli and dipplococci. Right—Little growth, gram negative bacillus.

91. Left—Staphylococcus aureus, gram positive and gram negative bacilli. Right—Staphylococcus aureus and large gram positive bacillus.

In other words, in these infected cases nine-

ty-two per cent (92%) of the screws had to be removed, while eight per cent (8%) remained after developing sinuses. With the autogenous bone grafts only eleven per cent (11%) were removed and eighty-nine per cent (89%) remained in place, as proven by X-ray and on killing the rabbits four months after the insertion of the grafts and finding them apparently continuous with the rest of the bone.

These two series demonstrated experimentally, first, a foreign body is far more apt to give trouble in the presence of infection than an autogenous graft, and second, an autogenous bone graft will "take" in a proportion of cases in the presence of various types of acute and chronic infections. Not for one moment, however, do we want to be understood to advocate any relaxation in aseptic technique, for absolute cleanliness is as essential in this class of work as it is in any other field of surgery.

To illustrate clinically the first of these two deductions we have only to realize almost every surgeon has had to remove Lane's plates, both in infected and non-infected cases—some of his own, as well as those of some other surgeon. Therefore, it would only be a waste of time to demonstrate our Lane plate failures.

Case No. 1 demonstrates better than any other case we have had the possibility of bone grafts taking in the presence of active infection.

Young man 22 years old, compound comminuted fracture of left tibia and fibula eleven weeks before admission to the hospital. X-ray (Fig. No. 3) showed not only the fracture but a detached piece of bone, and on exposure of fragments pus (smears of which the colon bacillus predominating) was found permeating all the tissues and about 200cc escaped after incision of skin.

It was decided to try an autogenous bone in-

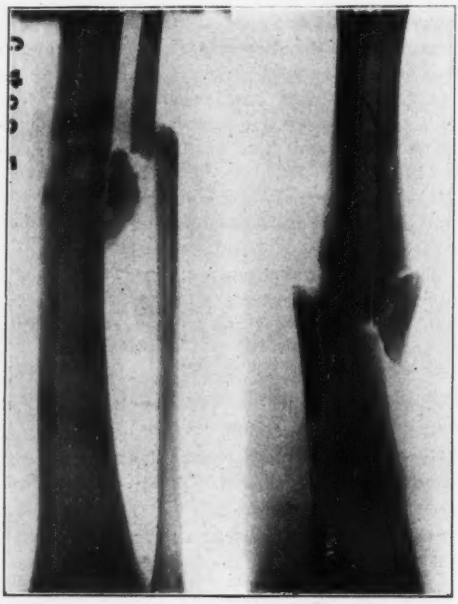


Figure 3, Case No. 1—Infected fracture of tibia and fibula with detached portion of bone.

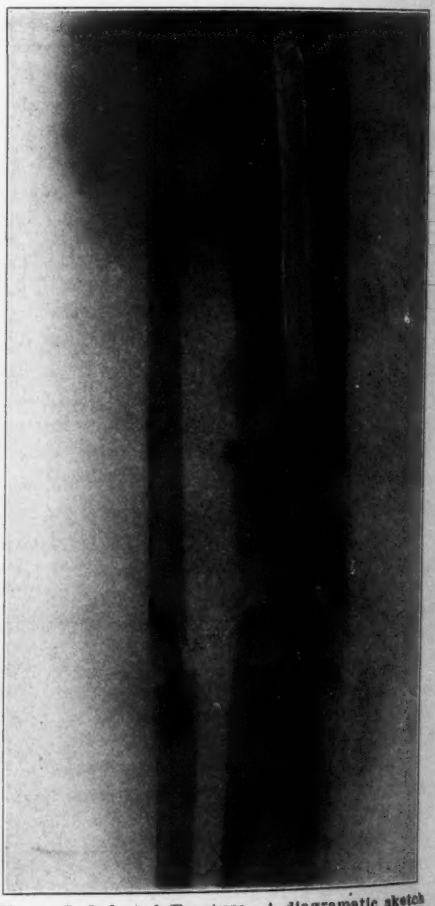


Figure 5, Infected Fracture—A diagramatic sketch of operation done in case No. 1.

lay graft in spite of the infection. This was done on Dec. 29, 1913, and as follows: Incision was made and dead bone removed, after which two parallel circular saws were used for making a groove, the pieces removed being utilized for the manufacture of five bone pegs, one of which was inserted as an intramedullary peg in the fibula. The other four were employed to hold in place a graft which had been removed from the upper part of the tibia. This last graft was obtained with two circular saws, but now being separated by a washer the thickness of the "set" of the two saws so as to make the graft fit tightly in the groove prepared for its reception. In other words, the washer allowes for the "sawdust." This is illustrated diagramically in Fig. 5. Fig. 6 and Fig. 10 show the case in two weeks and ten months, respectively; and the patient has a perfect functional result without any of the pegs or graft ever coming to the surface, and this in spite of the fact that there was almost constant drainage of pus for about two weeks following the operation.

A small vanadium steel screw was then placed in the epiphyseal line of tibia in a series of ten young rabbits varying in age from 4 to 6 weeks. This was done through as near an aseptic field as possible to obtain, and all rabbits showing any signs of infection were dis-

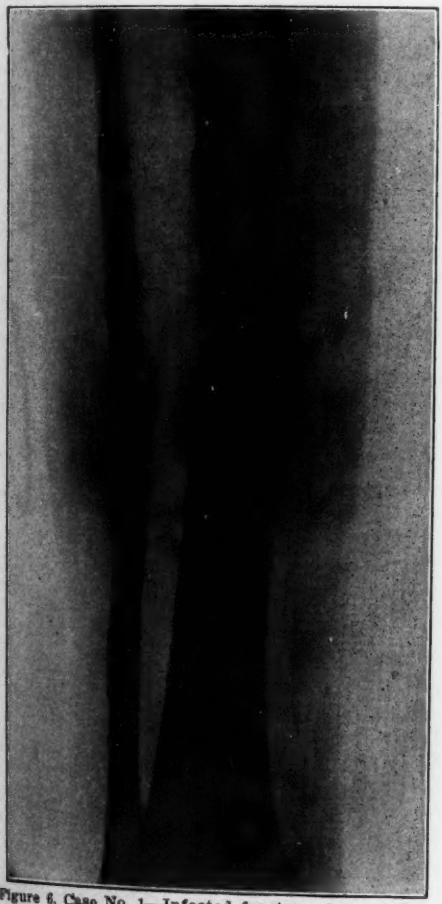


Figure 6, Case No. 1—Infected fracture, two weeks after operation.

Figure 10, Case No. 1—Infected fracture, ten months after operation.

carded. The hair was removed with barium sulphide and starch and the field cleaned up in the usual manner. X-rays were then taken on the following day to ascertain accurately the relative position of the screw, and at the end of six months all the rabbits were killed. In four of these cases there was a shortening of the tibia having the screw, varying between one-half to two cm. There was no ascertainable difference in six. In addition to this series, there were twelve rabbits which had to be discarded because the screw was not in the epiphyseal line and seven on account of sinuses and infections.

An autogenous spicule of bone was placed in the epiphyseal line of the tibia in a series of twelve young rabbits in a manner similar to that in which the screw had been placed, and in none of these cases was there any shortening, rabbits being killed in the same length of time. In other words, with steel screws, 40 per cent of the cases showed shortening in the long diameter, while with the autogenous pegs there was no shortening in any case.

Meissenback, in 1910, injected sterile water, Tr. iodine, alcohol, carbolic acid, formalin, various bacteria, etc., in the epiphyseal lines of a series of hares and found some of these, formalin especially, stimulated osteogenesis, but on the other hand, concluded a "retardation of growth may occur if the zone of provisional calcification is destroyed or if this zone is infiltrated by excessive blood clot or by destructive processes." It is this permanent destruction we feel occurs by the placing of a screw in the epiphyseal line, while with an autogenous peg such destruction is not permanent.

The importance of this part of the work is shown in the case of a small boy, aged 10years, who had an epiphyseal separation, with rotation outward, of the articular head of humerus to such an extent it was impossible to re-

Figure 12, Case No. 111—An epiphyseal seperation returned to normal position and held there by Lane plate.

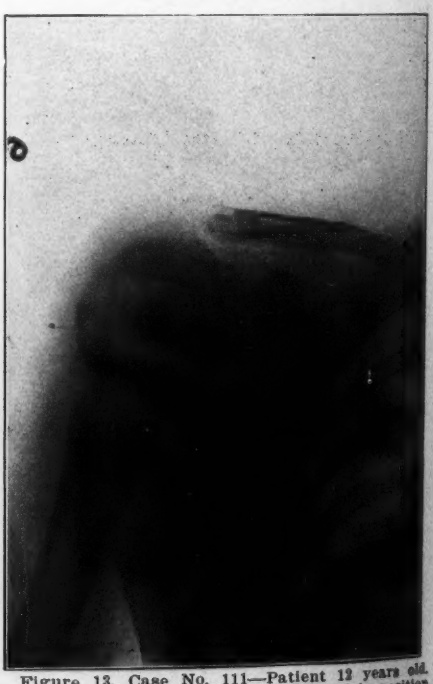


Figure 13, Case No. 111—Patient 12 years old. Epiphyseal separation of humerus held in position by means of autogenous bone peg. X-ray taken two weeks after operation, and operation on January 2, 1913, three weeks after injury.

duce it without open operation. The fragments were returned to their normal position as shown in Fig. 12 and held in position by means of a Lane's plate. This operation was done on Sept. 1, 1912, and on Oct. 8, 1914, the date on which the plate was removed, there was about three cm. shortening of the right (affected) arm. With this exception the boy obtained a perfect result, and it will be most interesting to watch the future development of the length of the arm without the plate.

Figure No. 13 shows one of three similar cases in which autogenous bone pegs were employed instead of Lane's plate, and while the time has not been as long, as yet there are no signs of shortening, and both results are perfect as regards function. Both of these cases have been done over a year, and the case in which Lane's plate was employed showed shortening in about six months, which at first was thought to be due to disuse of arm, but after return of full use of the arm and increased exercise it failed to develop as rapidly as the other arm.

So far this paper has not dealt directly with the "Treatment of Ununited Fractures," except largely from the standpoint of prevention, and it would require much longer time than we have at our disposal to discuss each special type of fracture; therefore, we will consider some of the general methods now employed.

Before any surgeon undertakes this type of work he should be equipped with an efficient electric motor. We have found a friction-driven motor with a long, flexible shaft far preferable to the cumbersome gear motor or the heavy hand motors on the market. A foot control of the electric current adds to the comfort and safety of both patient and surgeon. The metal part of the shaft can be boiled in oil while the remainder of the instrument can be covered with sterile cloth. We simply use a long bag about four feet long and three inches wide, with a purse-string at each end.

I believe the most important part in the treatment of these fractures is to have the fragments held in as near normal position as possible by as little foreign material as will serve this purpose without the intervention of any abnormal tissue.

So many surgeons holding this view have produced various operations the basis of each being to utilize autogenous bone grafts.

In the Journal of the A. M. A., April 4, 1914, we described our dowells or reamers, which we had been using then for about a year, and we have found them to be easy to handle and satisfactory in every detail. These, as can be seen in figure 15, are simply three cylinders of different sizes, at one end of which is a sawing edge. This end is placed over the fragment of bone to be fashioned into a peg and then the motor started. It

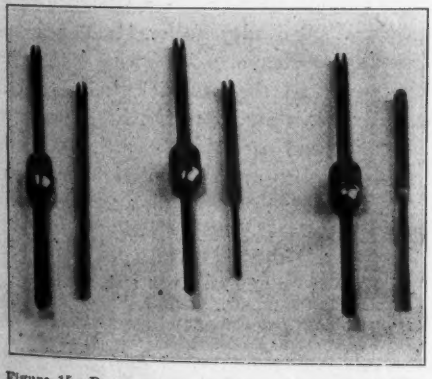


Figure 15—Reamers or dowels with drills of same size.

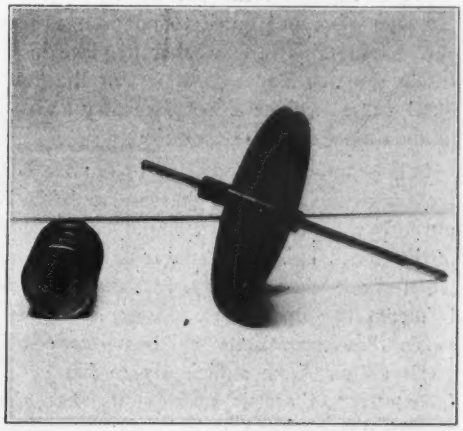


Figure 17—Two circular saws with various sized washers, allowing different width grafts to be used. Notice especially the small washer which is width of two saws.

only requires a few seconds to obtain a peg several inches long. The size of peg required depends on the strain to which the peg is to be subjeced. We have usually employed the smallest size, though for an intra-medullary peg the largest size is most frequently used. The strength of these pegs is surprising to one unaccustomed to them. In making these pegs it is best to allow a few drops of normal saline solution to play in front of the cutting edge so as to prevent any possibility of heating the bone. Not infrequently one can obtain several pegs from a fractured spicule of bone. In very oblique fractures it is not necessary to use an inlay graft but just simply to nail the fragments together with several of these pegs. Of course, the drills correspond in size to the pegs.

If one wants to manufacture an autogenous bone screw this is easily done by placing a peg in a mold and screwing down the "lugs." This impresses us as being a useless refinement and not possessing sufficient advantages to justify the waste of time.

The grafts can be held in place by catgut, but this requires about as much time to thread in place as it does to make and insert the pegs, and certainly a graft held by catgut is not as firm as one anchored with the pegs.

We have found the parallel saws (figure No. 17) easy and quick to operate, and are sure having this little washer to place in between the two blades to allow for the "saw-dust" makes a far more satisfactory and certainly a more accurate operation.

It is occasionally necessary to remove bone from parts remote to the fracture, and for this purpose we have always employed the crest of the tibia. This should never be done except when absolutely necessary, for such practically means two operations. If one is prepared to do these operations and has practiced on fresh animal bone sufficiently to handle the instruments, there is no reason why they should not be done quickly and accurately, but it is most certainly an operation not to be undertaken "lightly and ill-advisedly."

The part played by syphilis in such cases should at least teach us the importance of a Wassermann being made in each case, and the appropriate treatment instituted if found positive.

The treatment of ununited fractures in the old and feeble presents an entirely different problem, for here any radical surgery is out of the question, and yet the comfort of these patients has to be considered. In these cases a most careful search should be made for some of the constitutional diseases of old age, and proper medication started—at the same time comfortable splints should be applied so as to obtain partial immobilization and relief from pain.

We have made no mention of the role played by the periosteum in the repair of fractures, nor have we advanced any theory concerning the life of the grafts or pegs as regards their absorption or serving simply as a frame-work for new bone deposits, for to consider any of these points would constitute a separate essay. To be convinced of this one has only to review the literature published on these subjects during the past two or three years and then to consider the existing confusion, some of which seems to me to be due to a difference of opinion of what constitutes the true periosteum, whether the outer fibrous layer by itself or whether taken in conjunction with the underlying layer containing osteoblasts.

Before closing it is a pleasure for me to have this opportunity of extending my thanks to Dr. W. Brownley Foster, Health Officer of the City of Roanoke, for having taken entire charge of all the bacteriological work contained in this study; to Dr. E. T. Brady for his pains and care in the Xray work on the rabbits, and to my assistants for many hours of extra labor outside of their regular hospital duties.

DISCUSSION.

Papers of Drs. Knox and Trout.

Dr. R. L. Payne, Jr., Norfolk, Va.: To open the discussion on fractures, and especially after having heard the papers read this morning, is a very difficult proposition. I know of no problem in our general surgical work that is more of a puzzle to us than the treatment of fractures, and,

in that we do a great deal of railway surgery and see a large number of fractures every year, the problem becomes more pressing to us all the time.

It is especially evident from what has been said this morning that our present procedures are due to the evolution of our efforts to do away with the introduction of foreign bodies into open fracture wounds. There is no doubt but what the average plate has to be removed and more important is the fact that foreign bodies of the plate type almost invariably produce a delayed union. The trend of experimental work in the past year has led to the development of autogenous bone grafts, which I believe is going to solve the problem, but one in speaking upon this subject should be extremely careful as to what he says, and I only have to recite to you the main points brought out by Murphy concerning the periosteum as long as two years ago, which are almost completely refuted at the present time. How many of us here, in beginning our bone operations for fractures, have completely destroyed the periosteal covering, or have failed to bring the periosteal coverings together in the manner that we have been taught to do and urged to do by early bone writers, yet in those cases the results have been very good, and I believe that we can say this morning, regarding the periosteum, that in nearly every sense it is a limiting membrane. If we go back to the embryology of bones, we must recall the fact that the osteo-genetic centers start from the cartilage proper, and with these facts in mind I believe it will help us understand bone formation and help our bone surgery.

Now, there is one point I would like to refer to in connection with Dr. Knox's paper. He spoke particularly on the use of plaster in the treatment of fractures and the non-operative treatment. I believe, in the hands of the average man who does not do a great deal of plaster work, that the plaster is overdone, in that they obtain a too great immobility of the fracture. I believe Dr. Knox knocked the nail on the head when he said, in allowing the patient to get up that friction between the ends caused the union. I do not know when I have followed a paper which has dealt with actual work in the operating room that will prove of more value to me and to the rest of you than that of Dr. Trout, and he has clearly proved that the autogenous graft is better than any sort of a foreign body that can be produced.

Lastly, the X-ray. Too great importance is put on the X-ray as a diagnosis. Too little diagnosis attempted by the old physical signs, especially crepitus. How often, in failing to elicit crepitus, do we leave between the fragments of bone soft structures that militate against union.

Dr. J. Shelton Horsley, Richmond, Va.: I was attending the council and did not hear the papers, but it seems to me, in the treatment of fractures, the points we have to consider are the basic principles. Indirectly bearing upon that, the work that seems most valuable is the work of the presiding officer and of McWilliams, of New York, who has shown that bone need not be in contact with the osteogenetic living tissues to live. Why should it have to be in contact? The principle established by the experimentors is, after all, the same general underlying principle of nutrition. If there is a small piece of bone and considerable vitality, there is enough vitality to preserve that bone. It is simply a question of supply and demand. There is not enough nutrition to support the ordinary function and repair, too, and a large bone graft is absorbed. That has a vital bearing upon the treatment of ununited fractures. It was formerly the practice to saw the ends off, to screw them together, just as the cabinet-maker would make a joint, and expect them to unite and remain united. That type of operation was unsuccessful, and we know now why it was unsuccessful. It is a question of supplying sufficient nutrition to comply with the ordinary principle of repair. In most ununited fractures the callus or bony tissue fills up the ends of the bone as a solid block, so that the nutrition cannot get inside. That is occupied by bony tissues which has also to be nourished. The periosteum can give the only blood. We should cut down the amount of the bone to the minimum to merely a cylinder of bone, instead of a solid mass. There is then not only less bone, but room for the endosteum to extend to the injury. We know that a blood clot causes not only hyperaemia, but leukocytosis; so that instead of having an accurate union, we should make it rough. It seems that in some way the Lane plate does not stimulate the throwing out of bone tissue. That has been demonstrated, I think, fairly well. Of course in fractures, where there is plenty of nutrition. A Lane plate can be used.

Dr. H. P. Cole, Mobile, Ala.: Any findings of those who depart from the usual procedure are subject to criticism. I scarcely feel it my duty to defend the doctor's position, but I think we should all give him credit for stimulating our interest in a department of surgery which has been sadly neglected until within recent years.

Many visitors to Lane's clinics carry away the idea that he is an enthusiast on the open treatment of fractures, and perhaps he is. However, comparing the treatment of former days with the treatment by Lane plates in fractures of the tibia or femur, one cannot be other than deeply impressed by the final effects on the hip joint in Lane cases.

I have had no experience with the autogenous graft, but have had some slight experience with the Lane plates. The inability of osseous tissue to harbor a foreign body in the presence of infection is a fact now too evident to require comment. About two years ago a Pittsburgh physician reported the results of a series of collected cases operated on by bone plate in that city, with evidence in his report that infection had occurred in nearly 50 per cent of the cases. This is a commentary on technique rather than the method of treatment.

It seems hardly necessary to insist that all such cases should, in the first place, present no evidence of a circulating or concealed infection. The use of gloves and the proper instruments to prevent the introduction of even a gloved finger into the wound is essential.

In the past four years I have treated fifteen

cases by bone plate, none were compound fractures, though two were recently healed compound fractures. Several weeks after healing these two cases were bone-plated, and in both instances there was infection about the plates. I consider these cases of concealed infection. In two cases bone-plates were inserted near the epiphysis of the humerus in children 5 years of age. The plates were removed several weeks after union to prevent retardation of growth. I have seen loose plates remain without disturbance for two years; two cases have been men 60 years of age, with twenty-penny spikes through the femoral neck, remaining now nearly three years without infection.

Other men, I believe, have had the same experience.

In conclusion, I do not mean to say that the foreign body plate is more valuable than the autogenous graft, but in a great many properly selected cases with careful technique the Lane plate may be successfully employed.

Dr. Carroll W. Allen, New Orleans, La.: Mr. Chairmen and Gentlemen: This subject has been admirably presented by Dr. Trout, and I agree with him in the use of autogenous bone splints in preference to foreign bodies.

In regard to the treatment of non-union and vicious union, I think that the splint is particularly useful, especially in vicious union, where the fragments come together at an angle, and it is impossible to reduce it, or hold them reduced. When you break up the vicious union, and of course it must be done by open operation, and something used to hold the bone in proper alignment; there, I think, the bone inlay has a place. We often have to operate for the interposition of soft parts, and when those soft parts are of sufficient quantity that they have not disappeared under the pressure absorption between the two ends of the bone, here, too, the inlay can be used to advantage.

Dr. Knox calls attention and shows an ambulatory plaster cast which he has used very effectively. We have found a better method by using an instrument-maker's appliance. The cast we found too heavy. The one I wish to describe was introduced by Prof. Motes in our clinic several years ago, and has served so effectively to accomplish its purpose that we are operating on fewer cases of fracture than we formerly did. A cast is taken of the fractured limb. That cast is taken off by being slit before and behind. A mould is then taken of the patient's limb.

Suppose we illustrate it for a fracture of the tibia. The instrument-maker moulds around that a heavy piece of leather of which shoe soles are made. That is perforated for ventilation. It is allowed to dry and forms a perfect cast of the limb. It is trimmed so as to form a perfect support for the limb and laced together in front; two iron braces are put on the side and this iron rod is riveted on to this leather, then riveted on to the sole of the shoe just in front of the heel. This brace has a hinge joint at the ankle.

With this kind of appliance the patient takes care of himself, taking it off every night by unlacing it and giving the limb a good massage and bath before reapplying it next morning. Where there is but a limited amount of interposition of soft parts these will gradually be absorbed by the constant pressure of the ends of the bone, but where this interposed tissue is extensive or consists of tendons or apponeuroes, an operation becomes necessary. Cases that are tardy in uniting by the ambulatory plan, and where the bones are in good contact, can often be much hastened by passing a long fine needle down through a non-vascular area and scarifying the ends of the bones this creates a little hemorrhage and irritation—just enough to stimulate osteogenesis sufficient to bridge the gap between the bones.

Dr. Duncan Eve, Nashville, Tenn.: Mr. Chairman and Gentlemen: I have just gotten into the room and did not have the pleasure of hearing the paper or even the discussion. This is a subject I am very partial to, and one that I would like to enter into a discussion on, but not having heard the paper, I wish to be excused. I wish to state, however, it was not my own fault I have not been able to be here. I have been on the Council.

Dr. Jere L. Crook, Jackson, Tenn.: I am sure we have lost a fine discussion. Perhaps no paper read in recent years has provoked more discussion than the memorable one read by Mr. Lane at the A. M. A. about eight years ago. There are some by-products of this paper that are not good, and they are the indiscriminate operation for fractures and especially simple fracture by men not gifted with the technical ability to perform these operations and by our letting fall into disuse some of the operations we formerly did.

I think the doctor has given us the proper conservative note in the series of fractures. The pendulum has swung too far in the way of mechanical appliances next to the bone, as advocated by Mr. Lane. Dr. Trout has shown wonderful mechanical ability as regards his technic and results. It is stated that no operation should be done in the presence of potential infection. I believe the experience of many men over the country will contradict that. We did get good results before Mr. Lane read his paper, and are still getting them. We admit the conditions are not ideal where we operate on a compound fracture, but it is not always feasible to reduce the fracture without opening up the wound and clearing out the debris. If we do treat it without doing that, we are taking serious risks. Shortly after Mr. Lane read his paper I had two fractures—one by a sawyer, sawing the leg almost in two with the tendons and bones and everything else. I operated immediately and the man got splendid results. Another case, a man with a gunshot wound of the tibia. I did not have any Lane plate with me. I simply put a 6-penny nail through the bone and held it together. The nail was removed in about six months under cocaine. Here I secured firm union and a fine result. The main thing I wish to emphasize is this: If we do have to use any appliances outside of the external ones we have used, it seems to me we must substitute the autogenous bone graft for the other forms of mechanical appliances. Let's not forget the surgical technique and ability of our fathers in medicine, and that we have had fine results long be-

fore we had mechanical appliances; and let's get these bones into position by manipulation and by splints on the outside and not be too quick to operate in simple fractures.

Dr. Jos. A. Danna, New Orleans, La.: Mr. President: I wish to express my pleasure in having heard Dr. Trout's paper. He has described it perfectly beautifully—to use a very plain word. I am glad to have heard Dr. Allen speak in favor of conservatism in treating ununited fractures in other ways before operating, because there is a certain number of them treated in that way that will not need after-operation.

I am glad to hear Dr. Crook speak against the use of indiscriminate operations of the open kind, whether they be ununited or otherwise, but I merely arise to make a suggestion: Lane's work is beautiful. The osteoplastic work that the doctor has spoken of is very beautiful work. All these things require special instruments, training and technique. Every man in this room could not have done the work that Dr. Trout did, and if we can suggest some simple method that all of us can use, that will accomplish, in the majority of cases, the same results, I think we ought to do it.

I am not much of an artist, but take a fracture of the femur as an example (illustrating). An ununited fracture of the femur is a very common thing, and it is in such a fracture that appliances such as Lane's plates are of use. If we can suggest something simple that will accomplish the same result, we are doing a great deal. Dr. Allen's picture of the fracture is not what I have seen such fractures look like. Usually fractures of the femur look something like this (illustrating on board). The periosteum comes over this way and this way. What is it that has caused this condition of affairs? First of all, the overriding of ends because they were not broken across as evenly as that, they have slipped across, and then the muscular destruction has caused this overriding sometimes 2 to 4 inches. You want to get those two bones end to end. Is there any simple way in which that can be done? Incise the periosteum, peel it off of both ends and saw off each end with whatever instrument you please, just exactly that way (illustrating). When you have done that, the ends of the bones fall into position and they are end to end, but they stop a little bit laterally, then all you have to do is in suturing your periosteum to take it up a little bit, and you have the tough membranous sheet, and if the periosteum has not thrown off any new bone that prevents your bones from moving laterally.

Now all you need is a straight splint. The objection is advanced that the piece of the bone might be interfered with by the use of pegs here and here, and it gives you a procedure which requires the least amount of traumatism, and which interferes to the least extent with the actual nutrition of the parts, and I use this in every case of this kind, and I think the results justify the means.

Question: Don't you get shortening?

Dr. Danna: It does not matter what you use. I am speaking of fractures two or three months old—ununited fractures that we call ununited because they have not developed bony union, and this is usually one picture you have, so that you do not get any more shortening than by any other method.

Question: Suppose you had an acute case, how are you going to prevent that case from overlapping?

Dr. Danna: Of fracture of the femur?

Question: Yes.

Dr. Danna: It is almost impossible to do. X-ray studies of fracture of the femur show unless you do an open operation immediately (and I do not like to advocate that), that you get a certain amount of overriding, and I think that has been the experience of most of what work I have observed, but that is a point I have not touched upon, purposely.

Dr. R. L. Turner, Meridian, Miss.: I have enjoyed these excellent papers and the beautiful X-ray pictures of so many cases in which Lane's bone splints have been used, and I wish to say that I appreciate the work very much as a piece of art. Coming to the practical side of these cases of fracture, I feel there is a tendency with some to think that it is necessary to open and put on a Lane's splint, or some such retaining apparatus on most fractures.

I think there is a field of usefulness for Lane's splints, but that it is limited almost entirely to a vicious position of the bones, most of which would remain corrected if the patient is anesthetised and the proper apposition made, and then thoroughly and properly immobilized.

There are times when it is necessary to use a Lane's splint for awhile to hold bones in position in compound fractures with infection. I have seen a great deal of railroad surgery, and all of you know it is the severest kind of surgery we have to come in contact with; the tissues are severely traumatized and the patients are usually profoundly shocked. It has been my experience recently to see two railroad wrecks, in which over one hundred people were injured and more than thirty killed. All of these cases were handled without the use of a single Lane splint, with one exception, and that was in the case of a man so severely injured that it was thought for some time that he would die. Later an anesthetic was given and a vicious condition of the tibia corrected by the use of a Lane's splint, but after the ends of the tibia were cut off and adjustment made, the bones showed little tendency to become displaced.

Dr. R. W. Knox, Houston, Texas: It would seem, from remarks of the last speaker, that if overriding occurs in the case of fracture of the femur the proper thing to do would be to wait for a few months and then cut down and remove the overlapping portion, a process which would greatly shorten the leg. In my opinion, where we have access to a good X-ray machine and are unable to keep the fractured femur from overriding, the operation should be done within the first ten days and the bone plated, if necessary, according to Lane's method. Under proper precautions and proper handling there is very little danger in this method and it certainly saves the patient a long period of invalidism and the final results are much better. I have had no experience with bone pegs nor bone grafts, but I can see no reason why a steel splint should not be made just as aseptic

and have a greater holding power than the material mentioned. The danger of non-union from delayed operation is greater as the bone at this time may have exhausted its power of reproduction. If the bone plate is put on properly, not too superficially nor too near the joints, there is no reason why it should not remain indefinitely without removal.

THREATENED AND REAL GANGRENE OF THE EXTREMITIES AS SEEN BY THE MODERN SURGEON. ITS CAUSES AND TREATMENT.*

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The providential introduction of asepsis into general surgical practice has revolutionized conditions that must have been painful, intolerable and discouraging in the extreme to thoughtful men. Only by hearsay now from those of our masters fortunate enough to have lived through the one era and to have aided in the development of the other, do we realize the conditions that formerly prevailed and marvel at the herculean efforts put forward to overcome them. Certain forms of ailment are banished forever, certain ones are still with us to a slight degree; still others are present, draped in a garb somewhat different and less dreadful, but none the less baffling—perhaps even more so because of the obscurity of underlying causes and the consequent difficulty of overcoming them. Of these, gangrene of the extremities presents many features worthy of study.

It is obvious that an impaired circulation is the forerunner of any gangrenous process. It is not so clear, however, that the circulation is not primarily at fault in many instances, and gives way only toward the last when supporting structures have entirely abandoned it! An illustrative case will perhaps explain this better than a detailed explanation.

A Mr. S., age 34, had suffered from an extremely severe tonsillitis, which had been badly handled, until he fell into the hands of Dr. J. McP. Scott, of Hagerstown, Md., when proper measures for relief were for the first time instituted. Gradually the infection yielded and the patient was well on the road to recovery when he began to complain of pain on the dorsum of his left foot. An infection—surely of metastatic origin—made its appearance and, in spite of prompt and thorough treatment, spread. Several other areas of infection arose, and finally the whole foot became gangrenous, the patient meantime lapsing into a state suggestive, but only suggestive, of septicaemia. When I saw him the throat was nearly well, but the foot was gangrenous, and in addition there was a well-defined thrombosis of the internal saphenous vein almost up to the groin. There was some oedema of the lower leg, but no line of demarcation. Careful examination revealed the fact that the circulation was intact down to the mid-point of the calf. It was therefore decided to amputate just below the knee, but before anything was done the internal saphenous vein was ligated doubly just at its entrance into the femoral vein and just above the thrombotic process, this precaution being taken to eliminate the possibility of infectious material washing into the general circulation from the thrombi. The vessel was not cut between the ligatures for fear of infecting the tissues of the groin. As a further precaution, a dissecting amputation was carried out; a tourniquet could have done untold damage to vessels already threatened and might have crushed, and therefore spread, the thrombi contained in the saphenous vein. The patient recovered.

This, then, is a septic, an embolic, gangrene. Infectious material was assuredly carried by the vessels, possibly minute capillary emboli occurred, but no one would lay the resultant gangrene primarily to the door of the vascular system.

As a rule, though, the fault is in the first and in the last analysis a circulatory one. The traumatic gangrene need not be dwelt upon. Always the result of an accident, diagnosis is not, as a rule, difficult, and the treatment is self-evident. Where possible a blood vessel suture or transplantation should be done promptly. Failing in this, the limb had best be

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removed without further ado. But these cases are quite simple. I pass them over. The real cases are those consequent upon a systemic circulatory lapse, whether this be a sclerosis, a thrombosis or some spastic vascular process, whose etiology is as yet enigmatical. And curiously enough, old age, senility, does not play so great a role in these cases as is commonly supposed. The number of cases occurring among young middle-aged people apparently in the prime of life and the best of health is astonishingly large. The young woman upon all four of whose extremities I successfully did an arteriovenous anastomosis—reversal of the circulation—is the type of such cases.

Only 26 years of age, she had lost toes from both feet and one of her fingers was gangrenous, in addition to which her pain was excruciating and ever-present. The diagnosis was Raynaud's disease, by which we understand an intermitten spastic condition of the blood vessels, at times becoming tetanic in character, thus giving rise to horrible pain and disturbance of circulation sufficient to interfere with tissue life. Whether this has a central neurological origin or not is a disputed question, and need concern surgeons but little, since it is our part to deal with the effect rather than the cause. Certain it is, though, that at operation on this young woman no sign of sclerosis or thrombosis of the vessels was found. The arteries were patent, but seemed slightly smaller in caliber than normal, and the encircling sheath of connective tissue around vein and artery seemed a little more dense than usual. The only absolutely abnormal feature was the extreme irritability of the arteries, the most delicate manipulations being sufficient to cause sudden contraction of the vessel of such force as to shut off all blood-flow through the part affected. Since her operations, the last of which was done some two years ago, this patient has had no further gangrene, her pain has been relieved, and she is once more a useful member of society, being able to resume her occupation of saleswoman.

Several other similar cases, both as to cause and effect, have come under my care, the youngest being a man of 21, the oldest a man of 44. In no case was a thrombus found, in no instance was there any sign of generalized arterio-sclerosis.

But there is a group of cases in which thrombosis is the underlying cause, and a most distressing group it is, too, because so little can be done to help matters. Occurring most frequently in adults not quite middle-aged, it is found, according to my experience, localized usually in a single extremity, and its etiology is most obscure. In no case have I obtained a history of embolism, in no instance was there an old endocarditis that might have given rise to an embolus. The story usually extends over a year or several years, being associated occasionally with a slight injury to the foot or hand, with pain always a predominating feature, the circulatory disturbance always being considered of secondary importance, although at times it is most marked. At operation I have repeatedly found the femoral artery occluded by an old thrombus from Poupart's ligament down to the popliteal space, the accompanying vein being rather thick walled, but patent throughout its entire extent. Wieting, of Constantinople, has seen a number of such cases, and having gotten a history of marked abuse of tobacco, believes them to be due to nicotine poisoning. Several of my patients were inveterate users of tobacco and, with few exceptions, all of them were Russian Jews of the same class among which Wieting's cases occurred. So that I, too, was beginning to believe that perhaps it was a case of too much nicotine until along came a young, stalwart Italian, 33 years of age, who had used little or no tobacco during his entire life. And now I am not so sure.

An arteriovenous anastomosis is out of the question in cases of this description, because the thrombus apparently begins at or above Poupart's ligament, and this operation should never be done proximal to the profunda vessels.

I succeeded in giving temporary relief from pain to the Italian by removing the thrombus from his femoral artery (left) throughout its entire extent, my theory being that muscular contraction

of the blood vessel wall around the thrombus possibly was responsible for the pain. Whether this was true or not cannot be told with certainty. For a couple of months pain was greatly diminished, but as the circulation of the limb had not been improved, the old intractable ulcer of the big toe became more unruly and the foot progressively more swollen. Being still unwilling to cripple a man so young, I then ligated the patient's femoral vein, following the suggestion of von Oppel, of Russia, that with a deficient arterial inflow a slowing of the blood outflow was indicated. I was a bit timid about going the whole length of von Oppel's ideas and placing the ligature on the popliteal vein, but when no improvement followed my conservative femoral ligation, I then occluded the popliteal. With the exception of the rapid formation of collateral veins, no change occurred in the limb for several weeks, at the end of which time the foot took a rather sudden turn for the worse. Amputation was done just above the knee about eight months after the initial attempt to save the limb.

To some it might appear that it is a mere quibble to make a separate group of the cases just mentioned, that they are really instances of the thromboangiitis obliterans of Buerger, and ought to be so grouped. Perhaps this is the correct view to take, but my experience leads me to believe otherwise. I have seen cases of thromboangiitis obliterans—one not so very long ago—and have been able to do but little for them, especially the late cases. But the cases above referred to have a definite arterial thrombus that can be shelled out and a patent vein, while in the cases of thromboangiitis obliterans, vein as well as artery is involved in a sclero-thromboangiitis, the vessels being occluded by organized tissue that is so closely adherent to and a part of the wall that the two cannot be separated. It may well be, however, that the first condition is a forerunner of the second, although a differential diagnosis between the two is quite possible. Thus far the thrombus has begun at or above Poupart's ligament in every case that has come to my attention, precluding all attempts to conserve the limbs. It may well be, though, that in certain instances the thrombus arises below the profunda artery, in which case an arteriovenous suture would be the order of procedure. I await such a case with interest.

The true thromboangiitis obliterans described by Buerger is almost in itself a disease entity, and a racial one at that. Encountered almost exclusively among the Russian Jews, it is characterized clinically by the insidious onset of a pain at first intermittently nagging, later on sharp, lancinating and constant. At first confined to the foot, the pain gradually involves the whole leg in a vise-like cramp, to relieve which most patients spend their time sitting up in bed with the affected leg—for the lower extremity is usually involved—flexed at the knee and hugged up against abdomen and chest by both hands and arms. In such an attitude do they even sleep a little.

Such a limb is usually pale and cool, but may at times take on a bluish-red flush suggestive of Raynaud's disease. As for pulse, there is none—anywhere—in the late cases, and the late cases are the ones usually seen. Occasionally one is encountered that has a femoral pulse, but in my experience these are rare. And the cause of their rarity is that, unlike certain other forms of threatened gangrene, gangrene *per se* really is not a feature of the disease until one, two or many years after its onset. Pain is the predominating feature, increasing pain, an ischaemic pain, that is, one which is caused by a diminished blood supply. Once the process is started there is a gradual progressive diminution of the blood supply and a coincident increase in the pain. And it is only when this pain becomes unbearable that these patients present themselves for treatment. They rarely come for gangrene, and it is extremly difficult to convince them that the seat of the trouble is in the blood vessels and not in the nerves.

It is impossible to do much of a palliative nature for these individuals for the simple reason that the process involves veins as well as arteries, the lumens of which are choked throughout their entire extent with an organized material very suggestive of a thrombus.

The walls of the vessels are thick and sclerotic and fuse with the contained tissue, as a result of which, instead of having two hollow tubes running the length of the limbs and carrying their nourishment, we have two solid cords that effectively deprive the limb of needed nourishment. One never obtains a history of embolism in these cases, or of sudden thrombosis, so that the impression is gained that at no time is there a true thrombus formation, but rather a gradual sclerosis attended by a slow deposition of fibrin and cell detritus at different points along the course of the vessels. Gradual accumulation, together with organization of the deposited material, results in the condition just described. There must be a time when palliative measures like arteriovenous anastomosis or even ligation of the popliteal vein might be of great benefit. Lilienthal, of New York, has seen a few of these and has reversed the circulation in several instances with good results. I have seen two suitable cases myself, but neither patient would submit to operation. The majority, though, are hopeless when first seen, and amputation alone can give them relief. Most of my patients have been males, but the condition also affects women, though to a lesser extent. Usually the lower extremities—one or both —alone are affected, but I have seen one instance where both arms and both legs were involved.

There remains for discussion still another large group of cases, namely, that class occurring in the aged or the prematurely aged, and resulting from an arterio-sclerosis—general or local as the case may be, but most frequently general. Recognized early, many of these cases—for their number is exceedingly large—can be aborted or postponed temporarily by rest, baths, diet, massage and general systemic treatment. But the great difficulty is that the cases usually go unrecognized in the first place and yield to treatment but poorly in the second place. Arterio-sclerosis is a chronic disease whose progress is slow and insidious, but none the less progressive, its development extending over years and years. Quite readily, then, should we realize the folly of attempting to stay its progress in any short space of time. An illustration of the hopelessness of the task is that of a recent case:

Mr. P. L. (patient of Dr. J. A. Seligman), where I successfully reversed the circulation and rejuvenated for the time being a limb (the right leg, to be more explicit), whose femoral artery was of the pipestem variety, though still patent. Relieved of his pain, the deadly numbness and tingling that had been so distressingly persistent and annoying, the foot once again warm and the ulcers on the toes healed, this patient, who had suffered a partial appopletic stroke one year prior to operation, became active again both in business and socially. Gradually, though, the old sclerosis, at work constantly, began to make itself felt in spite of all therapeutic opposition, until total obliteration of the femoral artery and vein was accomplished.

Arteriovenous anastomosis* can resuscitate a limb threatened with gangrene. It cannot stay the progress of any disease. Amputation was done in the case just cited, but since I had predicted this eventuality there was no complaint.

It is a question in cases such as these as to just what procedure to adopt. Those presenting the fully developed gangrene or the cold, lifeless, cadaveric near-gangrene offer little choice and call for no especial skill, deftness or even judgment, in their treatment. Quite another story is that of the threatened gangrene, the limb presenting merely a circulation slightly though distinctly impaired—the main feature being most frequently a burning pain coupled with coldness of the toes and foot and numbness and tingling—sensations horribly persistent, most marked at night and wearing both to patient and family, whose rest is almost as much disturbed as is that of the unwilling

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***There has been an unavoidable delay in publishing this paper, which was written in the summer of 1914 and read in November, 1914. This accounts for my failure in this article to reply to the recent attacks of Horsley (J. A., M.A., March 13, 1915) and Stetten (Surg., Gync. and Obstetrics, April, 1915) on arteriovenous anastomosis as an operation. I shall make this reply in the near future. The paper is in preparation now.**

and unfortunate night-prowling patient. My sympathy goes out to these individuals, who, unable to sleep because of the pain, unable even to remain in bed because of the numbness and tingling and the icy coldness, frequently walk from room to room the whole night long. One patient, a comparatively young man, too, formed the habit of walking the streets every night until about 3 o'clock in the morning, when, tired out and relieved of most of his pain, restful sleep was his portion until about 9 a.m.

What shall we do with these cases or for them? How shall they be relieved? Can they be relieved? Judging by the amount of morphine daily consumed by some of those who have fallen into my hands—I say consumed advisedly, since dosage to them is a joke—certain physicians have either decided all these questions affirmatively by giving morphine or, failing to decide them at all, have given the morphine as the best means of getting out of a hopeless and annoying predicament. But morphine does not relieve the pain—it hardly eases it. Due to an ischaemia, a lack of blood, of the parts affected and a consequent slow but progressive degeneration of the tissues necessarily involving nerves as well as other tissue, there are but two ways of relieving this pain —one, amputation of the part; two, improving the circulation before it is too late. The first is simple—too simple. The second is difficult —usually too difficult. Hot and cold baths involving sudden short change of widely different temperatures, hyperemia induced by baking and massage are all measures that should be tried. If they fail, the femoral vessels had best be exposed; if patent, an arteriovenous anastomosis should be the order of procedure. If occluded, amputation just above the knee is indicated, although before resorting to this, popliteal ligation of the veins might well be attempted.

It would carry me too far afield to take up at length the question of embolism and gangrene at this time, but since an embolus may get loose following any operative procedure of whatever magnitude (or from an endocarditis), and since irreparable damage practically always results, a word may be in order as to the proper line of treatment to be followed in dealing with those emboli that lodge in the arteries of the extremities. I have felt all along that it is a mistake to expose the vessel and remove the thrombus for the simple reason that it invariably reforms. Nor is it difficult to see why it reforms. Wherever an embolus finds its resting place it becomes attached to the vessel wall at that point with the consequent destruction of its endothelial lining, and no matter how soon it is removed the result is the same, namely, a vessel is left which is hollow all right, but whose inner surface is rough and minutely torn. Being devoid of its normal glaze and being rough and minutely torn this wall forms the most favorable possible place for the deposition of fibrin, platelets and red and white corpuscles. So that within a few hours after the removal of a thrombus and the turning on of the renewed blood stream, another thrombus is invariably formed at the exact site of the old one. I refer the skeptics among you to the voluminous literature of thrombus removal for confirmation of this.

I therefore urge, I strongly advise, not the removal of, but the short-circuiting of the thrombus in these cases. A vein always accompanies the artery. Tie off the artery above and below the thrombus and do an end to end or a lateral suture between artery and vein above and below the ties. Or if the thrombus is so extensive that it is impossoble or inadvisable to get below it, I would suggest a lateral suture between artery and vein above it, with a tie put on the vein proximal to the suture. This will give a reversed circulation, which will answer every purpose. The return flow will take care of itself, as it does without difficulty in every case where this operation is done.*

I would conclude this paper by saying that gangrene of the extremities is an affection that occurs in the young as well as the old; it

is of more frequent occurrence than most men believe; there are many different types, there are many different causes. That symptom most common to all forms is pain—pain that is most difficult to relieve, becoming toward the end all but unbearable. The condition is usually overlooked in its early stages because careful examination of the vascular apparatus of the extremities is not the rule with most medical men. Thus far modern surgery has given a certain degree of amelioration even to the late cases. What it will do for the early cases is therefore easy to surmise.

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*I have refrained from discussing the so-called diabetic gangrene, because in a paper of this sort it seemed out of place. Occurring rather as an incident in a systemic disease, its discussion would necessarily involve some consideration, at least, of diabetes, which the time at my disposal did not permit. A future paper will deal with this subject.

DISCUSSION.

Dr. LeGrand Guerry, Columbia, S. C.: Mr. Chairman, Dr. Bernheim was good enough to ask me to open the discussion on this paper. I think we are all due him a vote of thanks, for this is an extremely interesting paper, especially to those of us who have kept somewhat up with Dr. Bernheim's work in the field of vascular surgery.

One interesting thing about it, it occurs to me, and to the rest of us who are interested in these things, is that it is not an easy field of surgery. It is one thing to talk about doing an arterio-venous anastomosis between the femoral artery and the peripheral vein, and it is quite another thing to do it. I think in order to do it successfully a man must be very skillful and have actual experience in suturing, etc., and the only place this experience can be gotten is in the experimental laboratory. One needs to do this work successfully with special surgical equipment. The needles and the instruments for doing this work are of a very delicate nature, and when we undertake to do any type of vascular surgery we must have special equipment to enable us to do it satisfactorily. You cannot suture well so small and delicate a thing as a vein with a needle that you would use in an ordinary intestinal operation. I wish to make this plea in these cases: the majority of gangrene of the extremities that I see are gangrenes that come in the old people. Of course rest and hygiene and diet will improve them, but in these cases that the doctor has spoken of, morphine does not relieve them of this extreme suffering that comes from a gangrenous part. These cases should be given the advantages of a surgical operation, whether the indications are an arterio-venous anastomosis or whether one intends to sever the artery and the vein and reverse in that way the circulation. So I say, my opinion and belief about these things is that these cases, no matter how serious they are, should be given the advantage of a reasonable surgical effort to relieve them.

One other point, and that is this: It would appear from what has been said and from the literature of these things (and Dr. Bernheim here is doing a great work in relieving these cases and putting them on a rational surgical foundation) that we are going through the same condition we did in the surgery of the appendix and of the gall bladder. We must get the cases early, because the operations done in a stage of oncoming gangrene—in a stage just starting—will give one set of results, and the operation, when completed, will have an entirely different result.

Dr. J. C. Bloodgood, Baltimore, Md.: Mr. President, may I ask the doctor one question? Dr. Bernheim, what is the objection to dissecting out the artery in which the embolus is present, and the transplantation of a segment of vein? I am asking whether a resection, if possible, would not be as good as an arteriovenous anastomosis? There are so many popliteal emboli after operation and the lumen of the artery is small.

Dr. Bernheim closes: It would answer the purpose just as well to resect the vein as to do an anastomosis. But the reason I advise an anastomosis is because it is much easier and takes less time to do a lateral anastomosis than it does to take out the involved section of the artery and do a transplant. In the case of an embolus of the popliteal artery it is far more simple to do a lateral anastomosis between the femoral artery and vein than to go down into the popliteal space where the exposure may be difficult and insufficient, excise the thrombosed segment of artery and interpose a segment of vein in the defect created. It takes too long.

About not every one being able to do a blood vessel suture, that is true. Dr. Guerry is correct. The only answer is that more surgeons should learn how to do it.

RECENT EXPERIENCES IN SPINAL SURGERY.*

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In presenting the following cases for the consideration of the Association, the writer has endeavored to bring out certain facts to add a little to the general surgical experience in treating spinal cases. In some instances these facts confirm the prevailing conception or published statements in regard to these af-

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fections and in others fail to secure results commensurate with the claims of some authors.

I. SPINAL FRACTURE—DISLOCATION.

The first case is reported chiefly to show what can be accomplished by even late operations for the relief of spinal cord compression and paralysis.

This patient was a little girl, S. M., six and a half years old, who, on November 29, 1913, was sitting on a log watching some men cutting down a large tree. The tree fell on her and she was bent double and pinioned to the log under her. Upon being released the child fainted, was cyanosed and could breathe only with difficulty. She was revived, but it was immediately evident that she was paralyzed from the waist down, and on more careful inspection a knuckle was seen at the first, second and third lumbar vertebrae, projecting backward beyond the surrounding parts three-fourths of an inch. The child was soon carried to a hospital, where an eminent neurologist, the surgeons and family physician concluded it was inexpedient and dangerous at that time, owing to the extreme shock, to consider operative relief. The X-rays then made showed fracture of the arches and such close approximation of the first and third lumbar vertebral bodies that the body of the second vertebra was dislocated to the left through an arc of nearly ninety degrees of rotation with fracture of the articular processes and laminae of that region. This produced a marked flattening of the spinal canal from before backward with bony constriction of the cord and upper portion of the cauda equina. Careful neurological examination made at that time showed complete motor paralysis and anaesthesia from the fracture down with retention followed by incontinence of urine and foeces from paralysis of the sphincters. Much trouble was experienced later by a tendency to impaction of the bowels. The child was placed on a Bradford bed frame and the trunk was steadied by sandbags and she remained at this hospital until January, the condition remaining unchanged, except that sensation returned to the front of the pelvis, the upper third of the thighs, and the gluteal region. The incontinence was distressingly annoying and only with great diligence could bed-sores and chafing be prevented. The case was referred to me on April 9, 1914, when I first saw her, and I had her admitted to the Kernan Hospital for Crippled Children. On examination there seemed to be at that time some return of power in the psoas and iliacus, the anesthesia was unchanged, but her feet were in talipes equinus and if the child was put in an erect position the knees were hyper-extended (genu recurvation) and likely to give away just as we see in complete paraplegia from anterior poliomyelitis.

On May 22, 1914, under a rectangular lateral skin flap, laminectomy was done, six months and twenty-five days after the accident. The arches of the first, second and third lumbar vertebrae were removed after biting away with ronguers the spinous processes which were found to be firmly ankylosed and fused together. The dura was much thickened and no pulsation in the vessels in the lower part of the cord and cauda equina was appreciable until the thickened membranes had been well dissected away above and below. At birth the cord extends to the lower margin of the last lumbar vertebra, and in this small child the cauda equina was seen to begin at the middle of the third lumbar vertebra. The wound was covered only by the skin flap which was closed with a subcuticular silver stitch. For two or three weeks after the operation the region of the skin flap bulged and fluctuated like a large spina bifida and then flattened out. The kyphosis was removed of course by the operation. Progressively the power began to return in the legs aided by thorough daily massage and later the reflexes which had been absent could be elicited. The anaesthesia cleared up more slowly and for at least two and a half months after the operation the soles of the feet, the back of the legs and thighs, and the region of the anus were anaesthetic. Finally by September 1, 1914, the control of the sphincters was fully restored. On September 7 tenotomies of the Achilles tendons were done to relieve the equinus and on October 30 the child was discharged cured, wearing stop-joint ankle braces to prevent a recurrence of the contracture of the heel cords.

Of spinal injuries 60 per cent are fracture-dislocations, 20 per cent fracture alone, and 20 per cent dislocations alone. The cervical and dorsal regions are more frequently injured than the lumbar and the higher the lesion the more serious the case and the greater the operative risk. Adult males in middle life more commonly suffer from these spinal accidents than females or children. Authorities differ as to the proper time to operate but the consensus of opinion favors early operation. With the absence of reflexes, Bowlby, Thor-

born, and Herter advise against operation, whereas in the present case the reflexes were absent yet recovery ensued. With the severest spinal cord injuries, viz.: puncture, laceration, etc., one finds a few successful cases following immediate operation. Lauenstein advocates waiting six to ten weeks for natural repair aided by head and foot traction, fixation by plaster corsets and in selected cases by manipulative reductions under anæsthesia. Horsley advises operation if immediate extension does not reduce the deformity. In 168 cases analyzed by Burrell in 1894, 22 per cent recovered by expectant treatment and 33 per cent recovered after operative treatment. Gault, in 270 non-operative cases collected, found the mortality 80 per cent. Thorborn, in 61 operative cases, gave a death rate of 50 per cent.

2. SACRO-ILIAC STRAIN OR DISLOCATION.

Since Goldthwait's observation of the prevalence of a gaping of the sacro-iliac synchondrosis as shown by the X-ray in supposed cases of so-called sciatica with varying degrees of iliac displacements forward or backward and consequent irritation of the sciatic nerve in passing over the sharp edge of the sacrum, the profession at large has readily recognized this common type of injury. In diagnosis, pain down the back of the leg is intensified in flexing at the hips the fully extended leg (Goldthwait's sign. The case I am about to present was an extremely severe example of this affection. Congenital osseous anomalies or traumatic exostoses at this joint leading to symptoms have been reported by Goldthwait, Compton Riely, and Max Böhm.

In the case I wish to present, Miss J. E. T., age 31, fell down sixteen steps on May 29, 1904, first striking her spine and then turning a somersault. She was nauseated but did not faint and was unable to rise for an hour. Pain was then referred to the loins, crests of the ilia and especially the left sacro-iliac region. She was treated for six weeks by her family physician for spinal periostitis, with tincture of iodine, during which period she was incapacitated and the pain in the hips did not subside but got worse radiating down the back of the thighs and calves, especially on the left side. Following the accident the patient was troubled with dysmenorrhoea, having previously been well in this regard, and for four years she had treatment with tampon, douches, suppositories, dilatement and curettement and an incidental period of six weeks' treatment for nervous prostration. Following this as relief was not secured for the special symptoms an orthopedic surgeon was called in and promptly made a diagnosis of sacro-iliac strain from the X-rays and instituted seriatim strapping with surgeon's plaster, injections of carbolic acid into the joint to stimulate union, reduction of dislocation under ether, the application of jackets and pelvic straps. This brought her up to 1909, when a surgical consultant on viewing the X-rays suggested "Christian Science." This unfortunate next had an operation for an ovarian cyst and later for appendicitis and a coccygeal abscess. The patient had ptosis of the viscera with the accompanying indigestion, vomiting spells and the nervous train of symptoms usually associated and continued to suffer from the pelvic and leg symptoms but was "afraid to mention them," she says, "because she was called a neurasthenic and one doctor wanted to wager figuratively $1,000 she could not be cured, as it was in her head." She was referred to me by her family physician, Dr. John Evans, on September 26, 1913, and admitted to the hospital. At this time the X-rays showed a gaping of the sacro-iliac joints and an enormous transverse process on the left side of the lumbar vertebra which was ankylosed to the ilium and every marked movement of the body caused an opening and loosening of the sacro-iliac joints, notably the left.

On October 31, 1913, transversectomy was done on the left side of the fifth lumbar vertebra and a process as wide as two fingers and as long was cut away and at its external end was found ankylosed to the ilium. The patient was discharged December 12, 1913, after nine years of total or partial disability, most of the time in bed. This patient is free of pain and able to go about anywhere.

These patients often have referred abdominal, crural and pelvic pains even in the uncomplicated cases, which tend to confuse the diagnosis.

3. PLASTIC SURGERY IN POTTS' DISEASE.

Much enthusiasm has been aroused among the spinal surgeons in the last few years by the addition of the work of Albee and Hibbs to the means we have had for controlling the

deformity which would naturally result from tuberculosis of the spine.

Briefly, Albee splits the spinous processes well above, below and over the diseased area in the vertebral bodies and inserts a graft of bone with peri- and endosteum obtained from the patient's tibia, which is sutured securely in place by kangaroo tendon.

Hibbs, with the same aim in view of producing speedy ankylosis in the diseased area posterior to the lesion and thereby preventing kyphosis, subperiosteally cuts a strip from the lower edge of each lamina, leaving the outer end attached and turns this down as a bone flap towards the one below. Then with special straight ronguers he cuts off each spinous process and moves them down half a vertebral width, so that in uniting the whole mass will become ankylosed. Our results before the introduction of these procedures by means of recumbency, traction, hyper-extension and fixation by jackets and braces, had been exceedingly satisfactory in a very large number of cases, but we wished a shorter period of treatment and especially of bracing. Overenthusiasm and a mistaken degree of positiveness that the new sound, scientific suggestions would be promptly curative has lead us to disappointment in that we expected too much. The writer would under no circumstances consider depending on either of these procedures unaided by the most exact application of the other methods we have hitherto employed satisfactorily. Although our experience has been much more extensive and covers a period of two years with Albee's operation, that of Hibbs employed more recently, would seem in the same comparative length of time to yield possibly better results and is a simpler operation. It is most difficult and unfair, however, to compare cases, for one operative spinal case may have sinuses, while another in which another measure was employed might not even have reached the stage where the cold abscess had extended beyond the confines of the initial vertebral body lesion. Suffice it to say, these operative means are added weapons with which we may fight this dreaded deformity of hump-back, and their originators deserve our gratitude and praise. But we should unquestionably not depend upon them exclusively, but continue to use also our reliable and tried methods of recumbency, hygiene, braces, etc.

2000 Maryland Avenue.

DISCUSSION.

Dr. Michael Hoke, Atlanta, Ga.: Mr. Chairman, these are all interesting cases of Dr. Taylor's, and I am very glad indeed that he presented them. I think at meetings like this certain of these things should be shown, for the reason that general surgeons and practitioners, not being very much interested in the details of this kind of work, do not recognize the progress that has taken place in the last ten years in treating the diseased and lame children and adults.

To operate upon the spine seems to have now advocates in men who formerly did not do it at all. I feel like Dr. Taylor, that its most useful phase is in the treatment of tuberculosis of the spine. I do not feel like the originators of the operation, that one should speak of curing the tubercular spine. We know that we can never tell when bone is well. The phase of any treatment of the spine is a most useful thing, and of course if one does protect the spine after operation for a long period of time, it enables them to do away with an apparatus that restricts the chest. All the old apparatus used and methods of treatment in certain cases restricted the chest, and we have seen the spines grow worse in plaster casts and in various forms of apparatus that restricted the chest. What is the use of putting the children in the air with the chest all cramped up? This phase of treatment in tuberculosis of the spine is certainly of very great use.

Dr. Alexius McGlannan, Baltimore Md.: Dr. Taylor's report illustrates an important principle of neural surgery; namely, that after injury, by proper treatment, instituted before secondary changes have occurred, we may expect regeneration with restoration of function, in those portions of the nervous system in which the fibres are provided with the white sheath of Schwann. This patient had an injury low in the vertebral column, and affecting the cauda. In all such cases prompt operation will relieve the nerves of pressure and allow suture or whatever else may be necessary for the relief of the injury.

When the injury of the column is high, early operation is even more important. Although we cannot obtain regeneration of gray matter that has been destroyed, or severely injured, prompt relief of pressure on the membranes or the cord itself by hemorrhage or bone will cure the patient. After section of the cord the patient's condition is hopeless, but he is not made any worse by the laminectomy, and early operation gives the best chance for cure of the patient suffering from the effects of pressure. Immediately after the acci-

dent, the symptoms are practically identical in both forms of injury, and delay until the lesions can be differentiated may permit the development of irremediable secondary changes in the cord.

Dr. Taylor closes: It is unnecessary for me to add much to what Dr. Hoke and Dr. McGlannon have just said, because my ideas coincide with theirs.

I think, however, the operative treatment will shorten the duration of the treatment of selected cases of Pott's disease by perhaps a year, but to say more than that would be to ignore the fact that in many respects it has been a serious disappointment to many of us. Thus in cases complicated with sinuses or psoas abscess or with paraplegia and exaggerated reflexes, they do not show any improvement with the operative method that we cannot obtain by surgical treatment, mechanical fixation and hyper-extension.

Of the two operative procedures, possibly the Hibbs operation is the better from our experience, as traumatizing the lesion less on account of the hammering incident to splitting the spinous processes by the other method.

The Albee operation, however, from a scientific, surgical and mechanical standpoint looks absolutely ideal. It is difficult to determine whether the original intra-osteal primary abscess in early cases has extended and broken through the confines of the bone or not, and if it has, it is here that the osteoplastic method of fixation has been a disappointment.

It was in these and the paraplegias we were led to hope that they would recover or heal sooner. Such has not been the case as the operation does not materially shorten the period that these tuberculously infected sinuses discharge.

An early operation, therefore, seems preferable, as in some of my operative cases where a graft of six or eight inches had to be inserted or an area of osteoplastic union was desired of the same extent, the end result was so ungainly and stiff for the patients that they seemed to mend slowly even if no sinus was present. When only one to three vertebrae are involved, is simpler and end result ankylosis less in extent.

By the accurate fixation in hyper-extension in recumbency and in braces and jackets, however, we can show a very large number of early cases in which we got not only no increase in deformity but recovery without deformity.

The operative treatment, however, shortens the duration of treatment a little bit, but we should not dare to omit the braces and jackets in the after-treatment for a long period after the operation.

AUTHORS' ABSTRACTS.

Surgery, Gynecology, Obstetrics, and Genito-urinary Diseases.

Side-to-Side Ileo Colic Anastamosis for Obstruction in Caecal Region. By A. P. Crain, Shreveport, La. Pan-American Surgical and Medical Journal, January, 1915, p. 11.

In bad pus cases and gangrene of the appendix with threatened stercoraceous vomiting and where caecum is extensively adhered to surrounding structures, and so friable that it is impossible to get at it in a satisfactory manner. I usually do a side-to-side anastamosis between the colon and ileum, in order to send the fecal current around the caecum for fear the lumen may be obliterated to some extent. It also takes off the extra work from the caecum, reducing the peristaltic wave, and prevents fecal fistula; also guards against ileus by not having to handle the intestines too much. I have recently operated two cases for carcinoma of the caecum, where it was very friable and extended some distance up the colon and down the ileum, lumen nearly obliterated. I did this operation and patient was up on the twelfth day and bowels moving fine. I expect later to remove the caecum if possible, as a new fecal current has been established and will in no way interfere with contemplated operation.

Gall-Bladder Disease. By J. H. Carter, Memphis, Tenn. Journal of the Tennessee State Medical Association, December, 1914, pp. 322-324.

To understand the cause, pathology, and treatment of gall-bladder disease, one must know the anatomical relations as well as its mechanical provisions.

There are two causes of disease of the gall-bladder, predisposing, or poor drainage; second, exciting, or bacteria. As long as the gall bladder is able to empty itself there is no field for growth of bacteria. Once the gall-bladder becomes infected and inflamed, it never returns to its normal condition, and therefore we have either recurrent attacks or exacerbations. The inflammation becomes chronic and causes poor drainage. The gall-bladder once infected is like the appendix, in that one attack predisposes to another attack, therefore it should be classed a surgical disease.

Diagnosis, usually, a careful history from the patient, and complaining of pain, nausea and vomiting, tenderness over the gall-bladder, rigid abdominal muscles over an enlarged and tender mass, with the history of dyspepsia and indigestion, should lead to a correct diagnosis.

Treatment: Rest in bed. Phosphate of soda dram one in one-half glass of hot water every four hours. No food of any kind during the attack. A recurrent attack of gall-bladder colic, with or without stones, is just as much an indication for surgical interference as in appendicitis. Therefore these patients should be operated upon before complications arise.

How to Sharpen a Scalpel. By V. Berry, Okmulgee, Okla. Surgery, Gynecology and Obstetrics, February, 1915, pp. 243.

A paste of No. 1 F carborundum powder is made by stirring the powder in melted tallow. Spread on leather strop and sharpen by drawing scalpel at right angles over strop. In cold weather if strop is too stiff add a few drops of olive oil to paste. A paste of No. 1 F corborundum powder for finishing gives a still keener edge. However, No. 1 gives a fine edge.

Stropping gives a rounded edge when repeated

often. To avoid this the instrument should occasionally be dressed down on a carborundum stone. A very fine stone costs about $1.00.

Inversion of the Uterus. By W. O. Roberts, Louisville, Ky. International Journal of Surgery, February, 1915, pp. 33-38.

The author presents a comprehensive review of the literature anent acute and chronic inversio uteri, and reports two cases successfully operated upon. One was an acute inversion occurring immediately after the completion of labor and which was reduced by taxis, the other was of four years standing in which he practiced vaginal excision of the protruding mass.

According to hospital statistics cited, inversio uteri is observed once in about 130,00 labors; but this probably does not represent the actual frequency. Inversion may be either obstetrical or gynecological in origin, and multiparae seem to be slightly more susceptible than primiparae. The diagnosis is not always easy, especially where inversion has become chronic.

The primary and essential etiological factors of obstetrical inversion are: (a) Relaxation of the uterine musculature, and (b) consequent inertia. Inordinate fundal pressure and undue funic traction represent the principal secondary causes. The gynecological causative lesions are fibromata, carcinomata, sarcomata, and polypi.

The pathology, symptomatology, prognosis and treatment are accorded adequate consideration. The mortality, according to various authors whose statistics are cited, ranges from 14 per cent to 75 per cent.

Treatment: In young women manual reduction (taxis) with or without subsequent tamponade should be faithfully tried. If failure attends this method, hysterotomy or surgical division of the constriction ring, with dilatation and reduction, may be successful. In chronic inversion vaginal excision of the protruding mass may be indicated. In elderly patients with chronic inversion total hysterectomy is the most appropriate treatment. The vagiual method is recommended as the safest procedure by Roberts and the majority of other surgeons.

The Operative Treatment of Gonorrheal Epididymitis. By Leigh F. Watson, Oklahoma City, Okla. Journal of the Oklahoma State Medical Association, February, 1915, pp. 287-289.

Epididymitis occurs as complication of gonorrheal urethritis in five to thirty per cent of all cases. Of the many complications that follow gonorrhea, epididymitis is most painful and slowest to respond to palliative treatment.

Operation simple and safe. Results are immediate and permanent. Is adapted to all cases. Local anesthesia is always sufficient. A one-tenth per cent cocain or one-fourth per cent novocain solution to which is added five minims of adrenalin chloride (1-10,000) for each ounce of anesthetic solution is used. Line of infiltration is made entirely around the scrotum just below external ring; the deeper tissues are then infiltrated along with cord of affected side. No infiltration of line of incision is necessary with this method. Line of incision is over most prominent part of tumor for a distance of two to three inches.

Several cases reported showing advantages of operative treatment in all stages of epididymitis.

The following conclusions are drawn: Immediate relief of pain is striking; patient often mentions it before leaving operating table. Swelling promptly subsides, regardless of whether fluid is found or not. Temperature is normal in twenty-four to forty-eight hours. Wound heals in few days. Patient able to return to work in two to five days. Treatment of complicating prostatitis or seminal vesiculitis is shortened after an epididymotomy. In cases of chronic urethritis with a history of epididymitis occurring early in course of disease, a latent infection of epididymis is probable cause, drainage of epididymis will often cure patient.

Closure of Pylorus. Case Report with Suggestion as to Technic. By Richard A. Barr, Nashville, Tenn. Journal of the American Medical Association, February 6, 1915, pp. 506, 507.

The necessity for making a closure of the pylorus in addition to doing gastro-jejunostomy for parapyloric ulcers is well recognized. In order to accomplish this an incision is made through the serous and muscular coats down to the mucus membrane. The incision may be longitudinal or transverse, and may be over the pylorus or to the duodenal or stomach side, according to the requirements of the given case. When the mucus membrane is reached by the incision that structure is separated from the muscle in front and behind so as to expose a cylinder from half an inch to an inch in length. Two clamps are put on this cylinder with just room for the incision which is made between them. A purse string of catgut is thrown around the base of each stump of mucus membrane, in the angle where it joins the muscular coat. The stumps are inverted into the lumen of the duodenum and stomach respectively, and the purse strings tightened. The sero-muscular incision is closed by one or two rows of sutures with inversion of the edges of the wound.

The Neglect of Deformities in Children. By Charles S. Venable, San Antonio, Texas. Texas State Journal of Medicine, January, 1915, pp. 369-372.

The classification of the causes of this evil are summarized into those: 1. In which no diagnosis has been made and the patient consequently permitted to drift; 2. In which the diagnosis is wrong and treatment misdirected, the result of superficial examinations. Illustrations, advancing hip disease, or even singular or multiple osteomyelitis passed on as rheumatism. 3. In which the diagnosis may be correct, but the treatment insufficient either in quantity or quality, too indefinite or too brief.

Emphasis is laid on the too prevalent belief on the part of the laity that two or three months is all sufficient to cure even tubercular processes, and the profession is urged to correct this by precept and example. A few of the more obvious deformities, only too grossly neglected, are spoken

practice so low? Because of ignorance and indifference of the laity and the cheap midwife. While these are admitedly factors, in the final anynlsis, lack of training of the medical graduate in practical obstetrics is the principal cause.

What is needed to raise the standard of obstetric practice? The medical curriculum should be revised so as to fit men to do the greatest good to the race. Obstetrics and general medicine should be intensively taught in the graduate course, as they are of such vital importance to the recent graduate, and the practice of surgery, which is largely elective, should be regulated by post-graduate teaching and efficiency.

Nerve Injuries Due to Bony Abnormalities. By Frederic M. Hanes, Richmond, Va. The Old Dominion Journal of Medicine and Surgery, December, 1914, pp. 235-242.

Abnormalities of sensation in the region of distribution of the ulnar nerve are not uncommon. These usually consist of pain and various paraesthesiae, such as tingling and numbness. The writer presents three cases exhibiting these symptoms, together with moderate wasting of the small hand-muscles inervated by the ulnar nerve. The first case is that of a man who developed symptoms of ulnar nerve injury twenty-five years after a fracture of the elbow. A mass of scar tissue had completely enveloped the ulnar nerve just at the ulnar groove. Great improvement resulted from operative interference.

The histories of two other patients suffering from the presence of cervical ribs are detailed, together with a discussion of the differential diagnosis of lesions of the lower cord of the brachial plexus. The article is illustrated with X-ray pictures and one diagram.

The X Rays in the Diagnosis of Fracture From a Medico-Legal Standpoint. By A. L. Gray, Richmond, Va. Virginia Medical Semi-Monthly, January 22, 1915, pp. 505-507.

The subject is considered from standpoint of patient, surgeon, and Roentgenologist. The patient is entitled to every possible means of ascertaining damage done in injuries to bony structures, and especially to determine whether in case of fracture the fragments are in such position that they will unite and the usefulness of member be unimpaired. The attending surgeon, usually family physician, naturally desires to spare his patient expense and often finds too late that a permanent impairment has resulted. He has subject his patient to far greater expense than the cost of the Roentgen examination. The surgeon safeguards himself in no way so completely as by a Roentgen picture made after adjusting the fragments.

The growth of the South as a manufacturing section has resulted in a corresponding increase in damage suits; the attending surgeon is not of in more detail: Club foot neglected until the child is beyond postural correction or simple tenotomies, and must submit to osteotomies for a worse result. In poliomyelitis if we see a patient during the initial attack and knowing that paralysis of groups of muscles is due to follow, then we are to blame if we do not attempt to limit or prevent these paralyses.

The insidious onset of tuberculosis of the hip is dwelt upon at some length describing the means of early recognition, and it is urged that the tubercular element be kept constantly in mind. The practice of waiting for fever and night cries is deplored, as then irreparable damage has already been done.

Transplantation of the Anterior Temporal Artery. By J. Shelton Horsley, Richmond, Va. Journal of the American Medical Association, January 30, 1915, pp. 408-410.

Dr. Horsley gives the details of an operation for transplantation of the anterior temporal artery and reports two cases on which this has been done. When the defect in the cheek is large, as from trauma, or after the excision of a malignant growth. it is sometimes difficult to repair it by skin of the same texture. A large flap can be taken from the forehead that is supplied by the anterior temporal artery. The artery with considerable surrounding tissue is dissected free and buried under an incision which goes just beneath the skin so as to avoid the branches of the facial nerve and extends from the margin of the defect to the origin of the artery. The flap should not be sutured closely but should be permitted to ooze for several days, as unsuccessful results are more likely to occur from too much nutrition than from too little.

Soft Tumor of the Urinary Bladder. By E. G. Ballenger and O. F. Elder, Atlanta, Ga. Journal of the American Medical Association, February 13, 1915, p. 580.

The injection of sterilized air or oxygen into the bladder makes it possible to demonstrate soft tumors of this viscus. While others have directed attention to this fact previously, we believe this case may not be without interest on account of the unusual clearness of the tumor shown in the roentgenogram. This was confirmed by operation, the tumor measuring two and three-quarter-inches in diameter. The actual diagnosis was first made by cystoscopic examination; we thought of treating it by fulguration. The roentgenogram led us to believe the size of the tumor indicated its extirpation. A year has now elapsed without its return. If the growth recurs we shall employ the fulguration treatment before it attains such a large size. Dr. J. E. Paullin, who examined the specimen, reported that it was a benign papilloma.

RAILWAY SURGERY

SEVERE CRUSHING INJURIES TO THE KNEE JOINT.*

By W. F. Smith, M.D.,
Division Surgeon Missouri Pacific and Iron Mountain R. R., Little Rock, Ark.

Death quickly following a severe and extensive crushing injury to the knee in three cases treated during a short space of time has suggested the question as to why an injury to this particular region is attended with a greater degree of shock than is manifested in an injury either above or below the knee. Suspicion is aroused as to the possibility of a faulty technique in meeting this condition.

An eminent railway surgeon, with over thirty years' experience, says that he never saw any but a fatal termination in injuries of this nature. Others also, having a large experience, agree that severe crushing injuries to the knee joint are followed by great shock.

The subject will be considered as follows:

1. What is traumatic shock?

2. Why does shock follow crushing injuries to the knee joint?

3. How may we combat the effects of this shock?

1. Briefly, traumatic shock may be described as a condition of reflex depression of the vital centers occurring after severe injuries, which depression may range from that of slight faintness to a vital decrease in functional activity from which there is no reaction and death ensues. The dilated pupils, reacting slowly to light and shade; the pallor of the skin and lips; the cold and clammy condition of the skin; irregularity in the hearts' action and respiration, with perhaps nausea and vomiting, all point to a vaso-motor paralysis of reflex origin from the peripheral nerves.

According to Crile's kinetic theory the essential lesions of shock are in the brain cells and are caused by the conversion of the potential energy stored in the brain cells into a kinetic force at the expense of certain chemical compounds stored in the cells. Muscular effort, in running brings about a depletion of the vital force as evidenced by physical exhaustion. When the expenditure of vital force is due to traumatic stimuli alone, especially if the stimuli are strong and the expenditure of energy is rapid, the condition of shock ensues with the characteristic changes in the Purkinje cells.

2. Why should there be such a degree of shock following a crushing injury to the knee?

The knee is the largest joint in the body with the largest spread of synovial membrane and a consequent greater sensitive nerve fiber distribution. Briefly speaking, the nervous system consists of two parts; first, the sensory neurone which takes up the stimulus received upon the skin or other sensory surface and by means of its process (or nerve fiber) conveys such impulse from the periphery towards the central aggregations of nerve cells that commonly lie in the vicinity of the body axis, along what is functionally known as the centripetal or efferent fiber. Now, this impression is transferred to the second element, the motor neurone, which in response sends out the impulse originating within the cell body (nerve cell) along the process (nerve fibre) known as the centrifugal or efferent fiber to the muscle cell, which causes contraction. There is, however, a much greater complexity in consequence of additional neurones by which the efferent impulses are distributed to nerve cells situated, not only in the immediate vicinity of the first neurone, but at different and distant connections. It is one of these mechanisms, the motor mechanism in particular, which through its phylogenetic association with injury of the individual, is responsible for the discharge of energy represented by shock.

*Read before Southern States Association of Railway Surgeons, Auxiliary to Southern Medical Association, Richmond, Va., November 9, 1914.

The injuries under consideration also involve the popliteal space and nerves. The branches of the external and internal popliteal nerves gathering up and transmitting all the attending efferent sensations, then joining into the thick cable represented by the great sciatic nerve and shooting its high voltage impulse into the cord through the sacral plexus having contact at the fourth and fifth lumbar and the first, second and third sacral and so on to the brain, would mean the depletion of many Purkinje cells and thus account for the shock. No shock attends an injury to the muscles of the back. Even the brain may be traumatized without the characteristic cell changes, which is due to the absence of sensitive nerves. The cutting or manipulation of the peritoneum increases the shock; but the simple manipulation without traction of the intestines causes no pain and consequently no shock for the reason just stated.

3. Shock is cumulative in effect. In the treatment the first consideration is to stop depressing changes in the brain cells and conserve the output of energy. Strychnia will not do it. The effect of morphine is to conserve the output of energy and thus combat the shock. The lowered blood pressure also is productive of exhaustive brain cell changes. A normal saline solution introduced into the circulation is a valuable but limited remedy. In a short time this fluid will be escaping through the vessel walls as rapidly as introduced and the abdominal viscera engorged.

In order to combat the vaso-motor paralysis it is necessary to introduce into the blood some substance in large enough quantities to develop a peripheral resistance through stretching the blood vessels. Nothing will meet this except a direct transfusion of human blood. Spinal block in the upper lumbar region may be resorted to, and I believe is indicated, in cases where evidence of active shock remains after amputation. Preceding this with a local block of 1-400 novocaine solution taking in the skin incision, the fascia and likewise the nerve trunks, should be infiltrated with the same, thus opposing and minimizing the existing shock and removing the menace of the destructive stimuli to the brain cells.

TREATMENT OF FRACTURE OF THE FEMUR BY MEANS OF A DOUBLE ANGULAR PLASTER SPLINT. THE TECHNIC OF ITS APPLICATION AND ADVANTAGES CLAIMED FOR IT.*

By J. H. Downey, M.D.,
Gainesville, Ga.

The etiology and diagnosis have been purposely left out, as we have these conditions thoroughly delineated in our various textbooks, and to which all agree on the essential points, but it is the treatment that there is such a diversity of opinion, that after looking up the literature on the subject one is at as great loss to know how to proceed as he was before; in other words, there have been so many ways mentioned, to make a choice is not any easy task.

My object in presenting this paper is to try and describe to you a method I have used with uniformly good symptomatic effect and those I have been able to get hold of for last year for skiagram show, I think, excellent anatomical results and comfort to the patient well worth mentioning. In taking up your time today I want to state here that I am not calling your attention to some wholly new fad. but to things that have been tried out by others, and proven their value, but not in the same relation I have used them.

For instance, Esmark's double inclined plane is a position of recognized value, but the ways so far devised for maintaining it were so cumbersome and the confinement of the patient so rigid as to render it almost useless. Plaster of Paris is today the standby of many physicians and surgeons, but the old

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*Read before Southern States Association of Railway Surgeons, Auxiliary to Southern Medical Association, Richmond, Va., November 9, 1914.

straight case as usually applied is a snare and a delusion because in any oblique fracture the natural shrinkage of the limb, the spasm of muscle and giving away of cast against perineum will allow limb to telescope into the case and result in shortening and deformity. Buck's extension is a time-honored method, yet we know that muscular action is not a mathematical problem, and no one can calculate the amount of weight necessary to overcome muscular action in different limbs or even in the same limb at different times, consequently you see our difficulty here.

But let us take our Esmark position and carefully bring the fragment into position by slow, gentle but firm mechanical traction, and then apply a properly fitted plaster cast in this position, and see what you have.

First, the limb is in a natural restful position with the muscles in a relaxed state, which promotes the comfort of the patient and lessens pain and tendency to displacement.

Second, in cases of fracture in upper and lower third, you can easily make your long fragment conform to the axis of your short one over which you often have little or no control.

Third, by your angles at the knee and hip you shorten materially the distance between your fixed point which is only from hip to knee instead of from hip to ankle, and further these angles serve as point of fixation in preventing telescoping or rotation. In fact, with any fracture where the fragments have been carefully adjusted and firmly held in this position, and the cast applied from base of toes to transverse nipple line, uniform good results is the rule.

Fourth, the freedom and comfort of the patient in this fixed angular position is the natural sitting and crutch positions, thereby greatly increasing his freedom and being rigidly fixed, lessens pain.

The technic of application:

It must be applied in two sections, first from base of toes to just above the knee, varying from two to four inches according to site of fracture. The second is from this point to transverse nipple line. The lower or first section must be applied before any attempt whatever to reduction.

For first section, pad limb well with cotton wadding from base of toes to four to six inches above the knee, with the knee flexed on the thigh, an assistant holding the limb in this position. You begin at the base of the toes and apply the plaster in the usual way until four to six layers thick around the knee; then take two strips of wire gauze (copper wire is best) two to four inches wide, according to the size of the limb, and from six to eight inches long. Lay one of these on each side of the limb, but do not allow them to meet in front of the knee. When you have these in place come over them with a number of layers sufficient to hold them. Only about half of the wire should be incorporated in the plaster of this section, then other ends being free. When this section is completed you are ready for reduction.

The pelvis should be firmly fixed in some way and elevated so as to get around the hips and body without movement to patient. Then arrange traction from the knee that will be steady, gentle and firm. Make your traction until by measurement and comparison you are confident of your reduction, then put on upper section.

First pad from upper end of lower section to transverse nipple line with your cotton wadding and cover this with a layer of plaster, bandage to hold in place, then cover this with a layer of thin plaster paste smeared over the upper end of the lower section to make your beginning layer of the upper one stick. Put on five or six layers, then bring your wire gauze down side of the limb and cover with several layers of plaster until sufficiently thick and go on up and complete the cast, reinforcing over the hip with a broad piece of wire gauze and many back and forth layers to ensure strength, for at this point you have only two-thirds of the circumference which materially weakens it and the weight

increases the chances for it to break, but if these precautions are taken the cast will hold firm for from three to four weeks, when another can be easily applied without extension.

To ensure a good cast, it should be freshly made from best dental plaster and fine crinoline with about twenty threads to the inch. Splints applied of this material as above described are cheap, light and secure.

If you fear swelling of the limb, split the cast from groin to toes. This will not impair the strength or durability very much.

In case of compound fracture, a square window of sufficient size to dress the wound can be cut in the cast without materially weakening it, and can be replaced after dressing and held firmly in position by an ordinary roller bandage.

In fractures of the neck in the aged or otherwise feeble, this method is of inestimable value, as it allows them to be up in chairs, and in suitable weather out of doors, and we usually get a moderate functional result. I mean by this, that they are able in three or four months to walk with a stick in a fair degree of comfort.

In the last six years I have not had any case of simple fracture of the femur to stay in bed over five days, and rare need of an opiate after the first forty-eight hours.

DISCUSSION.

Dr. E. C. Samuel, New Orleans, La.: I certainly want to say that the doctor has had wonderfully good results in that picture from an anatomical standpoint, and more particularly from a practical standpoint, but I see they are all lacking in one thing. At the time of fracture a picture made in one plane our anatomical position is sometimes remarkably good. When the lateral position is taken we see quite a displacement, and most of the time a separation of the articular surface of the fracture. The thing that gives us more information in regard to the fracture, the kind and extent of the fracture, is the stereoscopic radiograph first adopted by Dr. Beck, of Chicago. The apparatus on the market today is very easily manipulated. Any table is practically mechanical in its action, and the stereoscopic plate is no harder for the radiologist to make than any other plate. Very often a fracture that seems to be only in one line, when there is a stereoscope picture made of the case you will be able to deduct the line of the fracture, extending in possibly one or two directions. Illustrating: There was a case of a doctor's wife, a very prominent physician of our city—thrown from a horse. She was brought to the hospital. Dr. John B. Murphy was present at the time in New Orleans. X-ray pictures were taken and we only found a fracture of the spine of the tibia. Dr. Murphy taught me a lesson at that time. He told me to make a stereoscope picture. A stereoscope study was at once instituted, and we found a lineal fracture of the spine of the tibia extending into the knee joint itself. We all know what a fracture of the knee joint generally means. Some of them get along without ankylosis, but most of them don't; but the plea I make is that I would certainly like to see the stereoscopic study of the plate more in general use. It is a thing that we need and we are going to get better results from our fractures if we pay more attention in this direction. It takes a little longer. You have to wait sometimes until your plates are a little dry, but it gives you a better idea as to the extent of the fractures, and do not be satisfied with a plate of the radiologist taken only in one direction, because he is not only fooling the doctor, he is fooling himself.

Dr. T. H. Hancock, Atlanta, Ga.: Ten years ago we had this question, and we put them up like Dr. Downey, only I used steel strips like those used in making trunks; Dr. Copeland used wooden strips, and we got splendid results. This table with extension apparatus is a thing Dr. Downey has devised. Some years ago I devised a hip rest, and I was going to present it at a meeting at Charleston. Dr. Downey happened to have this table over there and my paper has never been read. The ratchet is like a brake on a street car, and wherever you pull it the ratchet holds it in place. There is no slip at all. Of course at that time we did not understand putting it on up to the knee before making the extension. I think it is an ideal way to treat these cases and you can take your skiagraph before your patient is removed. Very few require an anesthetic, but under this method you can make extension so gradually that you get your bones in place without any pain whatever; without that pain that a sudden pull gives, and you can take your picture from side to side and from above downwards. It is a splendid table and I could not get along without it.

Dr. Downey closes: The table is merely a mechanical device. That is my own arrangement for my own use, but the method is the thing—the application of the plaster of Paris—in that particular position is the thing that mostly interests me—taking the limb in that fixed flexed position, because just as soon as the water is dried out of that cast the patient can sit up in a chair and the rigid fixation prevents pain. Most of our surgeons are afraid, unless they are accustomed to it. You can tell them the man may get up, but they will not do it. I get them up just as soon as the plaster dries. I let them get in a chair and sit down. One case here, we set it Saturday night and he sat up next morning, all day, practically, and with a fair degree of comfort. And it is that particular degree of rigid fixation, using the angles at the hip and knee, with your natural muscle relaxation, which appears to me as a rational method of treating those fractures of the thigh and hip.

EYE, EAR, NOSE AND THROAT

VASCULAR LIGATION IN THE TONSILLAR FOSSA.*

By J. W. Jervey, M.D.,
Greenville, S. C.

There is a motto graven on the coins of the realm which reads, "In God we trust." I am inclined to think it should be displayed in the operating rooms of many laryngologists as a protection against hemorrhage during and after operations on the tonsils. It is humiliating to confess that up to a very few years ago my chief dependence for the control of hemorrhage in these cases lay in that same blind trust. But there is a sequel to the legend in another old expression, which reminds us that "God helps those who help themselves."

Many an anxious hour have I spent after a tonsil operation, and many a precious hour lost in bungling methods of pressure and swabbing and mopping with adrenal extract, and hydrogen peroxide, and even with that detestable old styptic called Monsel's solution.

After so long a while I reluctantly admitted to myself that tonsil operations as commonly done and accepted were not to be regarded as modern surgery. One of the fundamental principles of this science is the careful and positive control of hemorrhage, and this is quite as important as asepsis; indeed, it is even more imperative in throat surgery for reasons which there are at this moment neither the time nor the necessity for discussion.

It is strange that none of our text-books, so far as I am aware, even so excellent and recent a publication as Ballenger's fourth edition, give anything but passing attention to the control of hemorrhage in the tonsillar fossa. I quote from Ballenger, page 392: "The danger from hemorrhage is, perhaps, the greatest objection to the operation. It is real in that severe hemorrhage does occasionally occur. It is imaginary as to the reputed frequency of its occurrence and the degree of danger attending it." On page 422 he says: "If hemorrhage follows the operation it may be controlled by swabbing the sinus tonsillaris with a solution of permanganate of potash, one-eighth to one grain to the ounce of water. Peroxide of hydrogen may also be used for the same purpose. Stronger remedies are rarely required. Continuous gargling with iced water often controls it. Tonsil clamp forceps need rarely be used." On page 426 he says: "If the hemorrhage is severe, the bleeding points should be seized and twisted with artery forceps." With these few words the subject is dismissed, with the unavoidable inference that it is of little importance. Of this point those of you who have had much experience will judge for yourselves.

It should be understood that what I shall say further does not apply to those cases known as hemophiliacs. I have encountered in my limited career but one or two "bleeders." These were seen several years ago, and each time the hemorrhage was controlled by prolonged pressure—several hours—or, it might be said that it stopped spontaneously. Perhaps, after all, they were not really "bleeders." At any rate, such experiences are unpleasant.

For the surgical control of operative hemorrhage requiring ligation in this sinus, three things I find to be of elementary importance: (1) Proper instruments; (2) A competent assistant, and (3) A proper maintenance of anesthesia. The third requirement I have found to be satisfactorily met by the careful use of a warm ether vapor apparatus, pumping the vapor directly into the pharynx through a hooked tube which hangs in one corner of the mouth; the second is met by a very little training of an intelligent assistant, while the in-

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struments I use are as follows: Mouth gag, tongue depressor, half a dozen ordinary hemostatic forceps about eight inches long, six or eight small natural sponges, about one and one-half inches in diameter, a Rosenheim tonsil hemostatic forceps, a tonsil pillar retractor, my throat ligation forceps, and a No. 4, twisted silk ligature, eighteen or twenty inches long. The eight-inch forceps are for use chiefly as sponge holders.

The mouth gag being in place and the patient sufficiently anesthetized to control reflex pharyngeal movements, the assistant places the tongue depressor well back on the base of the tongue, drawing it forward and away from the tonsil area. It is assumed that the tonsil has just been enucleated and the hemorrhage is free. The assistant immediately presses a sponge, held in one of the eight-inch forceps, firmly into the emptied sinus. This is held in place for a minute or two, and if the bleeding persists the area is rapidly mopped with a fresh sponge, while the anterior pillar is retracted and the bleeding point located. If the vessel is not a spurter it is simply seized with an eight-inch forceps, held a moment, twisted and released. Often this will check the bleeding, but many times it will not. In the latter case the vessel may be re-seized with the same forceps and a ligature thrown around and secured.

In tying this simply with the hands, the first half of the surgeon's knot should be pushed with the index finger of one hand to the point of ligation. The free end of the posterior strand of the knot should then be wrapped two or three times around the second and third fingers to secure it against slipping, and the tip of the index finger is placed firmly on this strand close up behind the tip of the forceps. The assistant makes gentle traction on the forceps; the operator, with the index finger, works the ligature noose firmly down over the area to be tied, and pushing backward with this finger on the strand, he draws the knot tight with the other hand pulling on the anterior strand of the ligature from the outside of the mouth. It is not an especially difficult procedure. I have done it very many times; and, of course, it absolutely controls the hemorrhage once and for all.

However, I have found that the technique of this method can be made easier by the use of the Rosenheim forceps, which has a groove on the point of one jaw to hold the ligature at the desired location until the first half of the knot is to be tightened up; and by the use of the ligation forceps which I have devised, anyone, no matter how clumsy with his fingers, can tie a knot in the sinus tonsillaris without having to put a finger inside of the mouth. A little practice is all that is required.

The ligation forceps, which I present to you herewith, is a simple little device. Being about eight inches long, the distal ends are tiny broken circles placed at right angles to the shafts, and so constructed as to open perhaps two-thirds of an inch when the handles are closed. The instrument is used as follows: The Rosenheim forceps, armed with a ligature, being in place, the first half of the knot is tied. Just above this, then, the ends of the ligation forceps are easily threaded on the free strands of the ligature; the ligation forceps are carefully pushed down with the threaded strands approximately parallel with the Rosenheim hemostatic, and the half of the knot that has been turned will slide ahead, easily and gradually tightening, down to the point where the ligature is to be permanently placed. The assistant makes gentle traction on the hemostatic instrument; the ligation forceps are pushed slightly beyond the latter's tip, and the knot is tightened simply by firmly opening and closing the handles of the ligation forceps while strong counter traction is made on both free strands of the ligature, held in the other hand. The second half of the knot is completed in the same way. A rather large silk ligature seems best suited for the purpose.

The advantage of the method is in the avoidance of direct handling of the ligature, which always becomes slippery and slimy, and

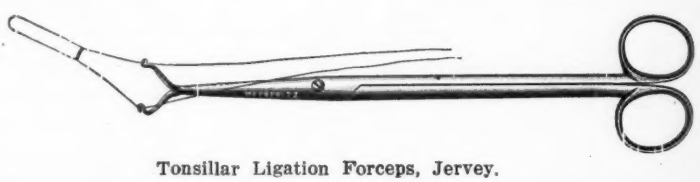
somewhat difficult to control when wet with blood or saliva. The method also permits an unobstructed view for the operator; and last, but not least, it is easier of accomplishment than the tying of a knot in this cavity with the fingers.

I believe that no operator has a moral right to make a shambles out of his operating room. Neither should a patient be subjected to any unnecessary risk or secondary bleeding. The hemorrhage can and should be controlled, and the modern tonsillectomy and adenectomy should be performed without even the appearance of blood on the patient's face.

DISCUSSION.

Dr. J. G. Murphy, Wilmington, N. C.: I notice the doctor speaks of hemorrhage appearing immediately after an operation, probably not a spurting vessel, but still a bleeding vessel. If a tonsil is dissected in a blunt way, as I believe the majority of operators do at the persent time, we have very few of these vessels, yet we do have them occasionally. I have a private practice entirely, no hospital connected with it. I have done about 500 cases; 94 last year, in private practice, and at the hospital in my city there is a saying that Dr. Murphy's method of stopping bleeding is to let it bleed. I do not object to a little blood after a tonsil enucleation, and I take out the entire tonsil, too. I am able to look at the tonsil five years afterwards and it is entirely out. I do not object to a little hemorrhage. And I do not want a hospital assistant putting a sponge in there and holding it there. I have had hemorrhages, pretty severe hemorrhages; I have had secondary hemorrhages, I have had them as much as ten days after an operation, and hemorrhages that were severe. My method of stopping the hemorrhage in these cases is to use a 50 per cent solution of adrenalin or suprarenalin, take a sponge on a Kelly forceps and apply it gently, and if that does not stop it, I use the full strength of adrenalin or suprarenalin, and I have never failed to stop a hemorrhage yet. I had a case a week ago. At 12 o'clock I operated, and returned to my office at 2:30 expecting to leave at 3. The patient was having severe hemorrhage. I ran over to one of the other specialists in the city and asked him to look after the case. He came to my office and got his instruments out and stitched up the tonsil and stopped the hemorrhage. It was a dull dissection; I do not put a cutting instrument on the tonsil at all. There was a vessel bleeding, but it could have been stopped, in my opinion, with a 50 per cent solution of suprarenalin or adrenalin.

Dr. Lee Cohen, Baltimore, Md.: I would like to be placed on record as advocating the routine ligation of vessels in the tonsillar fossa after tonsillectomy. I think the ill effects of bleeding has been minimized very much. We do not always see the bleeding at the time we operate, but the effects are manifested often only by the failure of our patient to convalesce normally, and it takes the child three or four months to get strong. Dr. Casselberry, of Chicago, some years ago reported a case of a child, to whom he had been called in consultation, that bled to death after being returned to bed, and no one seemed to know that the child had been bleeding at all. In this case the blood of course had been swallowed. In Baltimore at least seven out of ten throat men have been ligating the vessels whether they bled severely or modrately, since 1909, when my paper first appeared on that subject in the Journal of the American Medical Association, read before the Section on Laryngology at Atlantic City. In 1910 a second paper appeared in which I reported 178 cases, 140 done under ether, without any primary or secondary bleeding, and 33 under cocaine, in which there was some delayed primary bleeding in three cases and one or two vessels had to be picked up. Since that time I have done not less than 1,200 tonsil operations, and I have yet to record a single case of primary or scondary bleeding. But I tie every vessel that bleeds, whether large or small. I do not use any special instrument to do it. I have used Dr. Jackson's ordinary long hemostat to pick the vessel up, and it is tied with No. 2 catgut. The ligature is pushed down with my left index finger and three knots tied in the catgut.



Tonsillar Ligation Forceps, Jervey.

Dr. C. R. Dufour, Washington, D. C.: I certainly agree with what Dr. Cohen said. I was at Atlantic City when we had that discussion on tonsillar hemorrhage. There is no doubt that we must ligate the vessels that bleed or put a hemostat on them to stop the bleeding. There is one particular vessel—I suppose some of you have had experience along that line—in the superior fossa—I think it is a branch of the tonsillar artery that comes down. That vessel bleeds, and bleeds very severely at times, not only when you have cut the tonsil loose, but when you have loosened it up with the finger. I loosen up the pillars with the finger. I believe in the blunt dissection. This vessel in the superior fossa bleeds very profusely. After I have loosened up the pillars I put a ligature or a hemostat on the vessel. I have adopted that plan at the Georgetown Uni-

versity Hospital. We do a great many tonsillar operations. We have had some hemorrhages there that were quite severe, but they have always been controlled by ligation.

I had a case at my office a year ago, a man of 33, a stoic foreigner, who had been sent to have his tonsils removed. He wanted me to take both of them out. I said that I would take one out and see what the result would be. I took one out, which was very fibrous in character. He stayed around the office for an hour or so. There was no indication of bleeding. I touched it up with a 50 per cent solution of iodine. There was no hemorrhage. I told him to go home and keep quiet. That night a brother physician called me up and said there was a man in his office bleeding severely from the tonsillar fossa. I think this vessel was a branch from the lingual. I sent him to the hospital. Before I could get him on the operating table he must have bled a quart of blood. I did not give him anything in the way of an anesthetic. I made a continuous suture and brought the two pillars together, bringing the pillar over the point of bleeding, and that stopped it. I told the man to stay in the hospital until I saw him again, but before day he got up and went out.

We usually take up these bleeding vessels with a hemostat. I have no instrument like the doctor has shown here, but sometimes I take a needle and pass a suture underneath the vessel and then tie it. If your fingers are short and the throat long, it is difficult to get well down in there. One of the difficulties in suturing in the throat is the needle-holder. If you have tried to suture in the throat with an ordinary needle-holder you will find a great deal of trouble. There is a staphyloraphy needle-holder made by Lane, of London, and I am having one made. It is a long needle-holder which will take the needle on the end and you can get in the throat wherever you want. In suturing up these pillars that I mentioned I had a great deal of trouble, because I had to use the ordinary needle-holder.

The doctor spoke of death from hemorrhage. One of our confreres in Washington had a case with a good deal of hemorrhage in a child four or five years of age. They stopped the hemorrhage, but three days afterwards hyperpyrexia developed, 106 or 107 degrees, and the child died.

Dr. H. S. Hedges, Charlottesville, Va.: I think we all agree heartily with Dr. Jervey. I cannot agree with Dr. Murphy. I think the use of adrenalin gives a false security, and bleeding is very apt to break out again. I do not think any man does justice to a patient to take him off the table if there is any bleeding at all.

Dr. H. H. Martin, Savannah, Ga.: I want to agree with Dr. Jervey and the other gentlemen who have advocated vascular ligation. I think in the vast majority of our cases we do not have any hemorrhages that amount to anything. In my experience I have been very lucky. I have not had a great many of them. But if I do, I shall attempt some form of vascular ligation. That is the cleverest little instrument I have ever seen.

As to Dr. Murphy's remarks, I must say frankly and honestly that I believe that any hemorrhage that can be promptly stopped with adrenalin or suprarenal extract would have stopped spontaneously.

Dr. T. W. Moore, Huntington, W. Va.: In tying a vessel between the pillars I think it is much better and I think it is really the easiest method of tying, to take a small needle in a needle holder and pass the needle through the tissue right beside where your forceps that are holding the vessel are placed. Then you can tie it and it will not slip. I have once or twice tied a vessel after I had caught it with the forceps and the ligature has slipped off, but by passing this ligature through the tissue the ligature cannot slip off. I really think it is much simpler and better, and you do not need any additional instruments excepting a needle holder and a small needle.

Dr. R. W. Bledsoe, Covington, Ky.: I want to agree with Dr. Moore in that respect; that is the way I do this ligation. Dr. McReynolds, of Dallas, Texas, some years ago got up a needle holder which I find most satisfactory. I put on a hemostat and then take about three sutures in the surrounding loose tissue and draw it together. There is no chance for the ligature to slip off. I have had them slip off after I had gotten them, as I thought, firmly tied.

Dr. Jervey (closing): I would only like to say, Mr. Chairman, in regard to Dr. Murphy's remarks, that Nature is a good doctor. I will fully agree with him, but why bait Nature?

Dr. Moore's suggestion for the passage of the needle through the tissues is a good one. I have never used it. But even so you will find that after having placed your suture the easy manner in which you can slip it down with this little device will very much facilitate it. Even where you have got it firmly fixed you have still got to make traction on the ligature with your fingers in the throat, and when you have got it wet with blood and saliva it is very unpleasant and difficult to handle. It is difficult to get a good grip on it and make a tight enough knot. So I think, even if you prefer to use that method, this little device for slipping the knot down and fastening it will come in very handily.

INTRA-NASAL OBSTRUCTIONS.*

By G. A. O'Connell, M.D.,
Birmingham, Ala.

The accessory nerves over the septum and the outer walls, and especially those branches from the spheno-palatine ganglion, over the turbinates, explain the acute sensitiveness of this area to any irritation or stimulation, thereby causing a paresis of the vaso-constrictor muscles, causing vascular engorgement of

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the erectile tissue. This may also result from a negative pressure within the nose, irritation from pressure, toxic elements in the blood, or some morbid condition of the turbinates or septum.

The free distribution of nerves over the septum and outer wall explains the reflex neurosis so frequently met with in pressure obstruction within the nose, especially the upper or vicious circle.

The functions of the nose are four: The respiratory, being the most important, the olfactory, phonatory and the gustatory, following in order of prominence. The respiratory function being the breathway of the inspiratory and expiratory air currents. On inspiration the air is warmed to near the body temperature as it passes through the nasal cavities, the erectile tissue playing an important part in this function. By this heat and moisture that is thrown off by the swell bodies or turbinates, and glands, irritation and shock to the mucosa of the lower respiratory tract and air vesicles is obviated. The air is expanded by the warmth from the swell bodies, takes up sufficient moisture so that when it reaches the air vesicles it is in a state favorable to the perfect interchange of gases.

The vibrissae of the nose act as filters to the inspired air, allaying much irritation that would necessarily result from the large quantities of dust and dirt that is always inhaled.

The nose or upper respiratory tract is the natural breathway, and during the passage of air through the nasal cavities it is especially prepared for the chemical interchange of gases. An obstruction to any part or parts of the nose interferes more or less with the efficiency of this organ.

The physiological process of transfusion of gases being, as we all know, the absorption of oxygen and the elimination of carbon dioxide, oxygen being essential to the processes of assimilation and nutrition, a lessened quantity gives rise to disturbed conditions of the digestive, assimilative and nutritive functions. The excess of carbon dioxide adds to these disturbances, it acts as a poison to the leucocytes, thus weakening and often destroying their activity. A normal quantity of carbon dioxide favors the assimilative and nutritive functions and also assists in metabolism.

The inspiratory air current instead of hugging the floor of the nose, follows an elliptic course from the vestibule to the middle and superior turbinates, and from this point along the roof of the nose, beneath the sphenoid sinuse to the posterior nares. During its course it does not remain in the middle plane but deviates towards the middle line soon after it leaves the anterior extremity of the middle turbinate.

During inspiration the air is drawn from the sinuses, a negative pressure is created, the external air rushes in to fill this vacuum, it passes over the inferior meatus, and comes in contact with the olfactory region, conveying the olfactory impressions.

Nasal respiration exerts an important influence over the circulation of the base of the skull. Normally speaking, every inspiration empties the ethmoid veins, and through them the longitudinal sinus and cavenous plexus.

With some intra-nasal obstruction to the inspiratory air current this mechanism is interferred with, causing a retardation of the venous return, causing a hyperaemia of the meninges.

The causes of nasal obstructions are many. They may be acquired or congenital in origin. Most of our experience is with the acquired forms of obstructions. The two most important and most frequently met with are the septal and the turbinal obstructions. The septal obstructions are either cartilagenous or osseous deviations, and very frequently a combination of these two are found.

The causes of septal deflections or deviations are from several conditions, and the various theories as to the causes are widely divided. To minutely discuss these theories would be asking too much of you, so I will try to be as brief as possible.

The theory of Talbot is the most acceptable of all, and in its contents are incorporated several other theories. He considers that a neurosis or stigmata of degeneracy causes either an arrest or an over growth in the development of the bones of the face, including the nasal bones. Illustrating this neurosis in the septum we have a deformed or deviated septum.

Trendelenberg and Freeman assert that a persistent high arch of the hard palate is the cause of a deflected septum, Morgagni that an excessive development of the bones of the septum is the cause, while Jarvis believes that it is due to heredity. Shaus and Welcher advance the theory that it is a faulty development, and Bosworth claims that trauma is the cause, and this is undoubtedly true in many cases. Ballinger concludes that it is due to inco-ordination in the development of the bones of the face, including those of the septum.

The cartilagenous septum has three deviations: (1) The anterior deflection of the anterior tip of the cartilage into one side of the vestibule interfering with the respiratory function of that side; (2) the angular deviation of the cartilage in the anterior-posterior direction, and is the most important of the cartilagenous deflections; but if limited to the anterior portion of the nose and inferior turbinate, is of less clinical importance than if it obstructed the middle meatus, which contains the nasal openings of the frontal, maxillary and anterior ethmoid sinuses of that side of the nose; (3) the perpendicular deviation of the cartilage interferes only with the respiration of that side without blocking the drainage of the sinuses.

The types to be considered in the osseous deflections are the obstructive deviations: (1) A ridge of septum pressing on the inferior turbinate; (2) a ridge pressing on the left inferior turbinate, and a convexity pressing on the right middle turbinate, or vice versa; (3) A split septum causing an obstruction on both sides; (4) an S shaped deflection; (5) a high deviation of the septum, closing the olfactory fissure; (6) a marked deviation of the septum along the crest of the vomer, wedged firmly against the inferior turbinate.

The only turbinates of clinical value are the middle and the inferior turbinates. Any protracted or continuous enlargement of the erectile tissue of these bodies interferes with the respiratory function as well as the drainage from the sinuses, and produces local as well as constitutional disturbances.

In the case of irritation, whether caused by atmospheric, bacteriocidal, chemical or from septal deflections, an engorgement of the erectile tissue results, causing obstruction with over nutrition activity of the glands, producing hyper-secretion.

The most important area within the nose is appropriately termed the vicious circle. This includes the middle turbinate, with the two important meati, namely, the superior and middle. A twenty-five cent piece would cover this entire area, and any obstruction to this region is liable to affect one or all of the sinuses of that side. The key to sinus disease is obstruction to its drainage, and the removal of that obstruction is the key to its successful treatment.

The obstructions that affect the vicious circle are: (1) deflection of the upper septum; (2) enlarged bullae ethmoidalis; (3) pneumatic cells in the uncinate process, which is the wall of the infundibulum; (4) the hyperplastic middle turbinate. We have two sets of obstructions, namely, upper and lower, and it is not at all uncommon to see a combination of both, causing a complete obstruction.

The upper obstruction is of greater importance as it attacks more or less the integrity of the vicious circle, and by obstructing the natural line of the breathway, prevents to a large extent the functional power of the nose, and lastly, preventing proper aeration and drainage of the accessory cells. The lower obstruction affects the respiratory function of that cavity and to an extent of interfering

with the adequate aeration of the sinuses of that side.

In these lower obstructions the increased amount of secretion drops down through the posterior nares. Where there is an obstruction of the posterior tip of the inferior turbinate the secretions thrown out by the sinuses and the nasal glands lie along the floor of the nose and on the inferior and middle turbinate, finally becoming inspissated and decomposed, inviting an admirable site for some pyogenic infection of that cavity, and the accessory sinuses of that side. When we have a superior obstruction about the vicious circle we have not only a pressure on the middle turbinate causing a marked neurosis, but the drainage of the sinuses is totally or partially obstructed, the increased vascularity is followed by an enlarged turbinate which increases the pressure and closes the remaining narrowed accessary orifice. The glands receive a direct stimulation from the pressure causing profuse secretion from this over-nutrition and stimulation. The sinuses share this stimulation and glandular activity, and the cavities fill up with their own retained secretion, and in cases of no infection they clear up with the recovery of the acute symptom, but the resistance of the lining membrane is more or less impaired. During the acute infection from any pyogenic organism the picture assumes a more serious aspect. The secretions become thick and purulent, and there is an outpouring of leucocytes. Only a small amount of this pus drains out, because of the narrowed opening and the quality of the pus. A small amount seems to be forced out from the intra-sinusoidal pressure.

The action of the pus and the effect of the pressure on the mucous lining causes an exfoliation of the external layers of the mucous membrane, followed by reformation of the mucosa with an increased amount of connective tissue with a predisposition for future infections. It is not uncommon to find a destruction of the mucous membrane lining the sinus, it being replaced by connective tissue or the cavity being filled with granulations, followed by bone necrosis.

Again in the superior or upper obstructions where the pressure has been maintained for a long time there is a loss of the olfactory function in that side of the nose, sometimes followed by pressure atrophy of the olfactory nerve filaments, which is a hopeless condition, and with it we also have a loss of special olfactory sense of taste on the anterior portion of the tongue of that side.

The other causes of nasal obstruction are neoplasms, malignant and benign, polyps being quite common. Hyperplastic and hypertrophic enlargements of the middle and inferior turbinates are frequently found. In all acute nasal conditions we find an engorgement of the erectile tissue, thus causing obstruction, this swelling usually subsides with the acute manifestations. Also in localized phlegmons. It is also a recognized fact that all exanthemata or specific fevers are ushered in with an acute rhinitis, obstruction resulting from the engorged turbinates.

Foreign bodies from their size and the attendant swelling cause obstruction; chronic granulations, such as nasal lupus, tuberculosis, syphilis, leprosy, glanders in its early stages until it reaches the condition of liquefactive necrosis, and actinomycosis.

Constitutional dyscrasias often give rise to rhinitis, causing obstruction. Then there are congenital deformities that also cause obstruction.

The conditions resulting from intra-nasal obstructions are numerous and are intensified according to the location and degree of that obstruction.

Where the nasal respiratory function is interfered with or destroyed metabolism is hindered, the chemical interchange of gases is unequalized; the absorption of oxygen is in a limited amount with an excess of carbon dioxide, which affects very materially the equilibrium and integrity of the individual cells. They are ill-nourished, their resisting powers

are lowered and they are more prone to the attacks of disease.

In nasal respiratory obstruction we have one or both nares affected. As alternating stenosis, the shrinking of the erectile tissue in one side and the swelling and congestion in the opposite sides. This condition exists more often when the patient is indoors. The nose feels stuffy and is frequently totally occluded, resulting in mouth breathing, this being more common at night, causing a dryness of the mucous membrane of the mouth, throat and lower respiratory tract.

The chief complaints are catarrhal manifestions such as post-nasal dripping, patients usually sucking a large amount of secretion from the posterior naso-pharynx, more especially on arising. This dripping of secretion in many cases is almost continuous, causing great discomfort, and in a post-nasal haucking and a clearing of the throat, a feeling of fulness at the root of the nose, often boring in character, and with this a frontal headache, either unilateral or bilateral, notwithstanding that the eyes have properly refracted and correction made, a predisposition to colds, head colds always the rule, with profuse discharge that is often thick and yellowish, frontal and frequently antral pain elicited on palpation. I have often observed in the patients suffering from nasal stenosis early fatigue of the eyes on usage. At night they fall asleep over their paper or book. The headaches, in many of these cases, are of the greatest severity, simulating closely neuralgic attacks, the whole side of the face being affected. Frequent and violent spells of sneezing are often complained of.

These patients are as a rule highly nervous, irritable and restless individuals, this being found more in the upper obstructions.

Tinnitus with varying degree of deafness are seen in the obstructions of the lower order, especially in the case of hypertrophy of the posterior end of the inferior turbinate. The swallowing of the post-nasal discharge accounts in many cases for indigestion and intestinal fermentation, having an obscure and indefinite origin. The voice resonance is imperfect, while the clearness and effectiveness of speech is damaged.

Considering the close anatomical relationship of the nose and its accessory sinuses to the important organs of the head, and from the direct communication of its nervous, lymphatic and circulative systems, we can readily see how easily bacterial activity can be disseminated.

In certain parts of the nose the frontal, sphenoid and ethmoid sinuses, there is but paper thickness of the bone separating them from the orbit and brain contents. The eye, through the lachrymo-nasal duct, is in direct communication with the nose. The optic nerve crosses the roof of the sphenoid sinus. An empyema of that sinus frequently has a marked influence on the vision with varying degrees of intensity. It is not uncommon to see an infection travel from the nose through the lachrymal duct to the eye.

Hooper advances a theory that faulty intranasal pressure can and often does cause asthenopia of both the ciliary and external occular muscles. He cites a number of cases in his own practice in which the asthenopic symptoms disappeared on the removal of that pressure. He concludes that a moderate amount of pressure and mechanical irritation of the middle turbinate against the adjacent septum will temporarily impair the function of the ciliary muscle. Mackenzie says that this mechanical pressure within a limited area (middle turbinate) does cause muscular asthenopia.

Active destructive lesions are also found from transferred infection or irritation, such as neuritis, choroiditis, retnitis, iritis, keratitis and many others resulting from an adjacent ethmoiditis or frontal sinusitis. Orbital cellulitis and abscess, as well as other serious and fatal eye conditions, are not as rare as is supposed.

In many cases of central scotomata the early symptoms of ethmoiditis affecting the optic nerve, has been found and by a prompt re-

moval of the middle turbinate, establishing the free drainage, saved the vision in many instances from permanent injury, but in a delayed operation or with no treatment the condition becomes hopeless. I consider that it is advisable, in fact, a necessity to proper diagnosis is to make a nasal examination in all optic nerve disturbances, and also in cases where a corrected error of refraction has not given relief in headaches and eye pains.

The proximity of the cranial contents explains the many affections from empyemia of the sinuses.

Bone and Frisco report the result of researches conducted at the Institute of Hygiene at Palermo, in which they established the fact that a germ deposited on the intact skin or mucosa is found soon afterward in the lymphatic ganglia of their respective regions.

The generous nerve distribution in the nose accounts for the numerous symptoms from pressure and irritation to these sensitive areas resulting in various reflected neuroses.

In the case of partial obstruction one nasal cavity does or attempts to do the work of both cavities, but this is impossible. Where there is a total obstruction of both cavities the respiratory function necessarily goes to the mouth, which is not an organ of respiration but more of an auxiliary breathway, yet proving at times most valuable.

In mouth breathing and unilateral nasal respiration there exists a more or less effort on the part of the individual to complete the respiratory act. In mouth breathers I feel justified in saying that there is irritation beginning with the mucous membrane of the mouth and is continuous to the most delicate mucosa of the air vessels, which naturally creates an over-secretion from the mucous and bronchial glands with catarrhal manifestations.

Pressure and obstruction within the vicious circle predisposes to sinus disease, ranging in degree from a simple acute to a chronic purulent sinusitis, with its aggravating and distressing symptoms and its important sequelae.

Complete anosmia or loss of smell, with the accompanying destruction of the olfactory sense of taste and the unfortunate is constantly exposed to the ingestion of poisonous or decayed articles of food and also the loss of protection from irritating and poisonous gases.

There are many reported cases of reflex neuroses, such as asthma, hyperthetic rhinitis, neuralgia and others that have promptly cleared up on the removal of the irritating factor, whether it be a polyp, an enlarged middle turbinate pressing on the septum, or a deflected septum.

As the nose is the entrance of the breathway, it is continually invaded by pathogenic bacteria, and it is very essential to have free drainage and ventilation, otherwise the free growth and propagation of bacteria is fostered.

Epileptic seizures dependent on intra-nasal pressure and obstructions have been reported by many observers. But for the lack of space I could cite innumerable cases of constitutional as well as local disturbances that have been reported as being caused from intra-nasal obstructions, especially of the upper portion of the nasal fossae.

In the treatment of these conditions it is a good rule to put the nose in the state of a respiratory organ, and by so doing you will convert the nasal fossae in as near a normal condition as possible.

It is also of advantage to search for any underlying constitutional dyscrasia, and if any evidences found, proper medical therapy should be instituted. The inferior turbinates have been more prone to constitutional disturbances.

Some years ago, on visiting a specialist's office, the first thing to attract one's attention was the grand array of spray bottles, and if one followed the daily lines of treatment one would see patient after patient taking his course of treatment for "catarrh." This treatment consisted in first shrinking the membranes with a cocaine and adrenalin solution.

This was followed by an alkaline spray and concluded with an oily spray. This treatment was handed out week after week and month after month, ad infinitum. Was informed several years ago by a specialist friend to the fact that he had a large number of patients with whom he had made a special monthly price for treatment. The patient could take daily treatments if he was so disposed. I have often wondered if he had ever considered the chances of cocaine addictions among these patients. Who amongst us have not felt the comfort and the feeling of well being in having open nasal passages?

The fault of the above treatment is that it is not lasting, but gives only temporary relief, and does not affect the offending cause one iota in the line of cure. The passages remain open for several hours because of the shrinking of the erectile tissue from the use of adrenalin and cocaine, but this is followed by a greater engorgement of the tissues, causing greater stenosis.

During an acute coryza the shrinking of the swollen membrane is often done first to assist in the drainage of the sinuses and relieve the stuffiness caused by the congested membranes.

In cases of permanent obstructions from the causes already named we can expect no cure through the continued use of the spray and nasal douche, and furthermore, the patient can spray and douche his own nose with as much result as the specialist and much more economically.

Any specialist who professes to any knowledge of nasal disease and its proper treatment, and who resorts to these obsolete methods, is either grossly ignorant or else he is a professional mercenary.

The day of spraying and douching the nose as a cure for nasal obstruction and catarrhal manifestations is past. I flatly refuse to accept any patient on a spraying proposition unless it be an acute condition, but never as a curative method.

It might be of interest to give the conclusions that were drawn by Willis Sanderson, of Detroit, on the effect of nasal obstruction artificially induced in dogs. His conclusions were these:

1. That nasal obstruction leads to death or serious impairment of vitality.

2. That the lowered resistance predisposes to infection.

3. That local disease of the respiratory tract is induced.

4. That obstruction of the nostrils leads to dilatation of the heart.

5. That changes in the skin and the blood of the dogs occurred.

6. That symptoms resembling asthma and emphysema occurred.

7. That emphysema of the lungs was demonstrated histologically.

8. That reopening of the occluded nostrils was followed by prompt disappearance of the symptoms.

AUTHORS' ABSTRACTS.

Eye, Ear, Nose and Throat.

Conservation of Vision. By B. F. Matheny, Clarksburg, W. Va. The West Virginia Medical Journal, April, 1915, pp. 331-334.

At the 1913 meeting of the American Medical Association a committee was appointed by the Council on Health and Public Instruction of fourteen men of prominence on Conservation of Vision, Dr. Frank Allport, of Chicago, chairman. This committee has an appropriate, plainly-written article each week in the Press Bulletin on important eye subjects. This is sent to and copied by 6,000 newspapers. They also wrote, printed, and circulated twenty pamphlets on popular eye topics which are sold at a small price of 5 cents each, and are given free to public libraries, women's clubs, teachers' institutes, etc. There are also other valuable ones in preparation that will be out soon, by good, able authors on interesting subjects: "What Gonorrhoea and Syphilis Will Do for the Eyes"; "Effects of Bad Printing of Papers, Books, etc., on the Eyes"; "Eyestrain and Crime"; "The Relationship Existing between Oculists and Opticians and the Medical Profession and Laity." The committee desired to create a national sentiment in favor of conservation of vision. In each state lecture bureau managers were appointed to superintend the work in their state, to arrange public lectures on conservation of vision in plain, understandable language in every town and city in their state. These lectures cover all methods of vision conservation. Especially the importance of the use of Crede's treatment of eyes of new-born babies, lessening of shop accidents, and systematic examination of all school children's eyes by the teacher or visiting nurse, or by a regular, well equipped physician if it can be afforded.

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Next Meeting, Dallas, Texas, Nov. 8, 9, 10, 11, 1915

EDITORIAL DEPARTMENT

TEXAS AND THE SOUTHERN MEDICAL ASSOCIATION.

The great state of Texas has a way of doing big things whenever she undertakes any enterprise. Her State Medical Association is perhaps the greatest medical organization in any state in the Union, and its Journal, under the able editorial management of Dr. Holmon Taylor, is surely one of the best, if not the best, state medical journal published. The recent meeting of the Texas State Medical Association at Fort Worth was, in the eyes of a visitor, a remarkable occasion, having had an attendance of 1,007 of its 3,600 members, and with a program of scientific work which compared favorably with that of any national meeting of physicians. To the Texan, however, it was an average meeting both in attendance and in the character of the papers read and discussed. The entertainments provided by the medical profession of Fort Worth were on the same grand scale, and altogether the occasion was one long to be remembered.

Texas has undertaken the entertainment of the Southern Medical Association in November, and from the enthusiasm manifested at the Fort Worth meeting it is evident that the united medical profession of the Empire State of the South is with Dallas in preparing for the greatest gathering of Southern physicians ever before assembled. President Oscar Dowling, ex-President Frank A. Jones and Secretary-Treasurer Seale Harris attended the meeting and were invited to address the Association. Each of them told of the aims and purposes of the Southern Medical Association, of its wonderful growth and of its hopes for the future. The Texas delegation at Richmond promised 1,000 new members for the Dallas meeting and from the results already attained by the Texas Committee on Membership, with Dr. O. M. Marchman, of Dallas, as chairman, and with local committees in each city, town and county, the Lone Star

State will have 1,500 members of the Southern Medical Association before the 1915 meeting ends.

The Dallas committee, with Dr. E. H. Cary as General Chairman, and with such men as Drs. S. E. Milliken, J. O. McReynolds, James H. Smart, M. E. Taber, A. B. Small, Turney White, C. M. Rosser, H. M Doolittle, E. Y. Dunlap, J. R. Worley, J. S. Tomkies and O. M. Marchman on the various committees, the arrangements and entertainments planned will equal those provided by any American city for any convention.

Dallas, with its splendid hotels, its magnificent public buildings and with a public-spirited citizenship that is accustomed to entertaning great gatherings, is an ideal convention city, and the plans and preparations for November presage a great meeting for the Southern Medical Association.

Texas has a number of great cities, and while there is a healthy rivalry among them, they all pull together for Texas. The physicians in Fort Worth, Houston, Galveston, San Antonio, Austin, Waco and in the other cities and in every town and hamlet of the Lone Star State are as enthusiastic over the Southern Medical Association as those in Dallas, and they are just as much interested in making the coming meeting a success as if it were to be in their home towns.

The officers of the Sections on Medicine, Surgery, Eye, Ear, Nose and Throat and Public Health report that their work is almost completed and there can be no doubt of wonderful scientific programs in all of the sections. The Southern States Association of Railway Surgeons will also attract many of the leading railway surgeons of the South to Dallas. Among those who are expected to attend the Dallas meeting of the Southern Medical Association are Surgeon General Gorgas, of the United States Army; Surgeon General Braisted, of the United States Navy; Surgeon General Blue, of the United States Public Health Service, and Dr. Cary T. Grayson, President Wilson's physician. It is not possible in an editorial to mention all of the distinguished physicians who are on the program and who will be at Dallas, but every Southern city and state will be represented by their leading men in all lines of work.

The growth of the Southern Medical Association has been phenomenal. Four years ago there were less than 300 members from six states, today it has a membership of more than 4,000, and before November there will be 5,000 members. Every indication points to an attendance of at least 2,000 at the Dallas meeting. The wonderful growth and development of the Southern Medical Association shows that the physicians of the South are alive to their opportunities and that they intend to do more than their part in solving Southern health problems.

THE VIRGINIA HEALTH ALMANAC FOR 1915.

This unique publication is a delightful combination of the scientific and the practical in a manner that is truly delightful to contemplate. Every month is given a calendar page and a page of miscellaneous items. The ordinary items for a calendar, such as the day of the week and of the month, the time of the rising and setting of the sun and moon and the phases of the latter is punctuated by such items of information as "Groundhog Day," "Sexagesima Sunday," "Mail January Birth and Death Certificates," "Virginia Colony requires records of deaths, 1631," and so on. The page of miscellaneous items contains gems of truth clothed in quaint and concise language, as, "You insure your life by a policy; insure your health by a privy." "If your dairyman brings you warm milk, make it hot for him." "Spare the shoes and spoil the child —with hookworm."

It also contains "Simple directions for the mother in the care of infants," "Bedside directions for the care of typhoid cases," "Directions for preparing disinfectants," "Plans for making sanitary privies and fly-traps."

The excellent work done by the Virginia

State Board of Health deserves more than casual mention. The character of such an organization always depends upon that of the man who controls and directs its work. To him should be given the credit for its success or the blame for its failure. Every state in the Union has a board of health and receives money to carry on the work of protecting the citizens from epidemic or contagious diseases and for correcting unsanitary conditions. The results vary greatly in the different states, but a cursory examination shows that it is by no means the Commonwealth that appropriates most money for the use of its health authorities that gets the best service. It is the state which has the best man for its state health officer that gets the most efficient work and secures the sympathy and cooperation of its citizens with his efforts to secure public sanitation. The measure of the man is the degree of his success. Judged by this criterion, Dr. Ennion G. Williams, president of the State Board of Health of Virginia, is a man of great abilities. He has his state thoroughly organized and is aided by the sympathy and support of the citizens of the entire state.

Under his presidency the board has worked with a harmony and efficiency, a vim and snap that is truly refreshing when compared with the formal, lifeless, uninterested perfunctory obedience to the law witnessed in so many states where nothing but the dead statutes, operated by fossil officials, represents the most vital element in the government of the modern social organization.

Virginia has cause to be proud of its Board of Health and its able president.

TYPHUS.

Dr. John F. Anderson, Director Hygienic Laboratory, United States Public Health Service, in a lecture before the Minnesota Pat' ological Society, March 30, 1915, and again before the Army Medical School, April 23, gave an interesting account of some of the work that has been done and the conclusions reached in a clinical study of typhoid fever, Rocky Mountain Spotted Fever, and Brill's "continuous" fever.

That Dr. Anderson speaks with authority will be conceded when it is remembered that it was through his studies, with Dr. Goldberger, that the identity of typhus with Brill's disease was proven, and that it was learned that the body louse is the only means of transmission of the disease. He states that one attack confers immunity, and that for this purpose an attack of Brill's typhus, the mortality of which is only 1:100, is equally effective as an attack of the form prevailing in Servia, with its appalling death rate. Prophylaxis centers on the body louse or on immunity through a previous attack. Dr. Anderson refers to the recently announced discovery by Plotz of an immunizing serum as possibly effectual, but seems to consider it more wise for those about to be subjected to infection to be inoculated with the mild form, Brill's disease. His directions for management of exposed persons are: To have the person thoroughly bathed, the hair cut and head disinfected. Dress patient in clean clothes and subject those removed to thorough cooking with steam. Relying on these simple measures the morbidity from typhus in Tunis, which in 1909 was 838 cases, was reduced in 1912 to 22. The only prophylaxis used was the systematic destruction of lice in the vicinity of patients with typhus. The subject should be kept under observation for twelve days, though the period of incubation is supposed to be only four or five days. The subject has a special interest at this time on account of the possibility that our own Gorgas may go to the relief of prostrate Servia.

STUDIES IN EXPERIMENTAL PNEUMONIA.

Some recent studies at Johns Hopkins, Department of Pathology, by S. Kline, M.D., and M. C. Winternitz, M.D., upon experimental pneumonia in rabbits, lead to apparently important conclusions. Avoiding their technical report (the *Journal of Experimental Medi-*

cine, April 1, 1915, page 304), they may be said to show that in order to implant the germs of pneumonia effectively in the lung the organisms must be introduced into the alveoli themselves. They must be placed as deeply in a bronchus as possible. "Large numbers of organisms injected into the trachea just beyond the larynx set up no great changes in the lungs, even though the injection be forcible. This fact suggests the presence of a protective mechanism in the upper air passages which, under normal circumstances, prevents the penetration of organisms into the blood." They also found that the vagi protected the lungs from foreign material in the pharynx and upper respiratory tract.

It has long been known that pathogenic germs are constantly found in the mouth and its secretions, and the mechanism just noted explains their innocuousness. When either or both of the vagi were divided the lungs were promptly invaded by various organisms, among them even the bacillus coli.

Further studies showed that immunity depends upon the presence of immune bodies, white blood cells, and a third factor which is dependent for its existence upon the presence of white blood cells *at the time of the infection.*

When animals that had been treated with benzol to reduce the number of leucocytes were given the immunizing injections they were far less effectual. Evidently a hyperleucocytosis is a very desirable condition in combatting the infection of pneumonia, either threatened or acquired, a fact that has long been recognized.

TUBERCULIN IN EXTENSIVE SUBDIVISION GIVEN BY THE MOUTH.

The good book warns us not to despise "the day of small things," and certainly in these days some remarkably small things are accredited with very large results. Dr. Solomon Solis Cohen has recently published an interesting account of his experience in the use of tuberculin in the treatment of "selected cases" of well developed pulmonary tuberculosis and its relapses.

He uses it entirely by the mouth and generally in tablet form. The peculiarity of his practice that awakens astonishment is the almost incredible minuteness of the doses administered. The tablets are supplied in two strengths, (a) one one-hundred-thousandth of a milligram; (b) one one-thousandth of a milligram. He directs that "to administer a dose of one-millionth of a milligram, tablet A should be dissolved in ten teaspoonfuls of water, one teaspoonful of which is to be added to the beef juice and the other nine thrown away."

In other words, one thousand millions of such doses would contains one gram of tuberculin. One of these phantom doses is given at intervals of several days.

This certainly looks like homeopathy run mad. It is not even "the hair of the dog," hardly, indeed, a smell of it, but rather a drop of water from the river across which the dog swam. Dr. Cohen gives clinical records of several typical cases thus treated, and a chart showing the reaction in a certain patient to whom, by mistake, a dose of one one-hundred-thousandth of a milligram was given instead of two one-millionths as had been intended. The temperature rose from 98.4 F. to 103 F., and the pulse from 90 to 128. He says: "There was no permanent ill result." How fortunate!

BATTLE CREEK ADVERTISING.

How long would any of us be tolerated in our medical societies did we advertise our supposed abilities to the people at large? How many referred cases would a surgeon get if his picture and his claims stared every one in the face in the magazines and newspapers? Yet those cases are parallel with the "Battle Creek Idea," which is to get all the patients possible from the doctors, hold them as supporters and advertisers and then draw on the public at large for everything they can get. For instance, in a full page article in the

Independent Weekly Magazine, of New York, April 26, 1915, and marked "advertisement," the following paragraph appears:

"The physician's warning to correct errors in diet is difficult to follow. The foods he prescribes are unskilfully prepared, while the rich and dangerous dishes he forbids are most tempting. Convenience and appetite conspire against following out the doctor's orders. . . . At Battle Creek the culinary department is under the charge of trained dieticians, etc. . . . At no other place is there obtainable such a large and palatable variety, etc. . . ."

Does a sanitarium that advertises directly to the public merit the patronage of the medical profession?

THE HARRISON LAW.

To use popular colloqualisms: Uncle Sam has spoken, and what he says goes. People are in the habit of regarding state and municipal regulations with a sort of good-natured toleration, to be obeyed or not, as might be. But not so with a law of the United States, backed by such penalties. The law was carefully and thoughtfully framed. It is no haphazard production. People who think they see a loose place in it here or an error there would find, upon investigation, that all those points have been threshed out, and that for all practical purposes the law is the best that can be done for the present.

It has been in force only three months, yet its effect in accomplishing what seemed to be possible only to a miracle, has been amazing. Its ultimate administration was placed in the hands of the medical profession, and almost without exception the doctors have proved faithful to their trust. Certain results feared by some thoughtful physicians have not materialized. Organized vice has not been able to capture the administration of the law, and very few of the victims of the habit have been harshly dealt with. Indeed, the only deaths coming immediately under the writer's notice were those of two very old people whose constitutions could not bear the shock of attempted reduction. No physician was to blame. Their own pride led to the disastrous experiment. Perhaps they are "better off," but it is a brutal impulse that leads to such a verdict. Life is sweet as long as love lasts. It is enough to make one proud of his profession to see how nobly it has accepted and executed this great trust; and no greater was ever imposed on any profession. The thing to do now is to refrain from any effort to change the law or its regulations in the slightest degree. Its success is wonderful enough to entitle it to stand as it is, at least for a year or two, to give the nation time to thoroughly understand and appreciate it. Let's let it alone. The JOURNAL refrains from copying or referring to any of the sections of the law. Every doctor is supposed to be supplied with a copy with his registration certificate. Our readers are referred to their own copies. In addition the regulations make it desirable to keep a record of every narcotic prescription.

AN INSULT TO THE MEDICAL PROFESSION.

One wonders what sort of medical men certain brazen-faced promoters are acquainted with that they should dare to make such revolting propositions to doctors of good standing in their communities as they are now doing. What can be the ground upon which they assume that professional honor is but a mask for greed, and that doctors are ready to sell their patients and their welfare for a money consideration! Yet all over the country the mail is bringing such insulting propositions to members of our profession. It is often well for the proposers that, especially in the South, their offers are not made personally. Were such the case some of them would bear visible evidence of the indignation felt by some of those thus approached. Two instances of such proposed graft have recently been reported to the JOURNAL from Florida, and they are proof positive that similar efforts are widespread. In one case a concern calling itself the "Capital City Company," No. 14 Potomac Bank Building, Wash-

ington, D. C., is distributing circular letters to "one doctor in a place," offering the privilege of earning a percentage on all the "Congress Tablets" he prescribes or causes to be sold, either through druggists or otherwise. Of course there are claims and explanations, but the gist of the matter is the doctor will use or prescribe Congress Tablets for a small and very temporary profit, regardless of the delicate varying of therapeutic needs. The word that "Dr. Blank uses them" goes out and the people who dose themselves will have new recruits through his influence. The goose has feathered the arrow that shall pierce his own heart. Meanwhile he must settle with his conscience the fact that he has regarded his own profit more than the welfare of the patient that trusted him.

The other instance referred to is afforded by a "Keeley Institute," which under date of April 26, 1915, sent to a well-known and thoroughly ethical physician in that state a circular beginning, "Confidential to Physicians," and saying: "Dear Doctor: We will mail you our check for $10.00 for each and every drug or liquor patient directed to us by you during the year 1915." Other words concerning the details of the contract follow. It is signed, in type, "The Keeley Institute." No beating about the bush in that! None of the pretense at being ethical! Just a plain offer of cash for the sale of the welfare of a suffering human being who trusts you. He supposes your knowledge and experience will enable you to know what is best for him to do. He will not imagine that you would send him to a place whose treatment was a secret from you, so that you do not know whether it will agree with his peculiar condition. The "Institute' has thought this all out. It has sized you up for a sneak, and has boldly made its offer. There is no legal redress for such an insult as this. The law that permits it should permit a cudgel in response. Meanwhile such instances as these should be reported to the county medical societies and thoroughly discussed. We are are liable to error, and if some brother has prescribed "Congress Tablets," or confused by meretricious claims has sent a patient to such an institute, let him own up like a man and join in a righteous effort to purge our profession from even the "appearance of evil."

DRUGGISTS COMPLAIN OF ILLEGIBLE PRESCRIPTIONS.

In England pharmacists are complaining of the illegible scrawls used by physicians in writing prescriptions, their complaint being that too often their meaning is left to the imagination of the clerk whose duty it is to translate the hierogliphics into medical latin. In one instance, where the prescription was absolutely illegible, the pharmacist compromised with his conscience by putting up a simple solution of magnesium sulphate.

It must be that English doctors stand on their dignity more loftily than do their American confreres. None of them can write worse scrawls than flow from the fountain pens of many of our own medical men, but here the druggist does not hesitate to call up a doctor to ask him, "what was in that prescription" he gave to Mrs. Smith this morning, and to complain that he "recognized the signature but that was all he could make of it." Druggists and patients have a right to demand that doctors shall, when writing prescriptions, either write a legible hand, dictate them to some school boy or girl who *can* write, or use a typewriter. Health and life may sometimes hang on the formation of a letter, the crossing of a t or the placing of a decimal point. No carelessness should be tolerated in prescription writing any more than in prescription filling.

ANCYLOSTOMA.

Dr. C. W. Stiles, of the United States National Museum at Washington, sends the JOURNAL a copy of "Opinion 66," rendered by the International Commission on Zoological Nomenclature, which deals with the "generic names of parasites reported for man." The

following paragraph contains the gist of the matter:

Summary.—The following Nematode and Gordiacea names are hereby placed in the Official List of Generic Names: Ancylostoma, Ascaris, Dracunculus, Gnathostoma, Necator, Strongyloides, Trichostrongylus, Gordius, and Paragordius.

It is well that some authoritative body has spoken to relieve the confusion of spelling displayed in medical writings when some of these terms are used.

Particularly noticeable have been the many different ways of spelling the word now officially spelled "ancylostoma." Not only the medical profession, but scientists at large, are under obligation to the International Commission on Zoological Nomenclature for their painstaking and conclusive studies. The JOURNAL will adopt their classification and spelling and henceforth "ancylostoma" should be used instead of ankylostoma, necator americanus, uncinaria americana and other synonyms for the Stiles hookworm.

HENRY ROSE CARTER, ASSISTANT SURGEON-GENERAL-AT-LARGE OF THE UNITED STATES PUBLIC HEALTH SERVICE.

Among the peace heroes, who have been accorded distinguished honors for conspicuous services rendered their country in the construction of the Panama Canal, special mention should be made of Henry Rose Carter. Congress created for him the position of Assistant Surgeon-General-at-Large of the United States Public Health Service, thus breaking all the precedents in recognizing the work of a member of that service. At the same time Congress advanced Surgeons James Clifford Perry and Claude Connor Pierce to the grade of Senior Surgeon.

Dr. Carter's work on "The Determination of the Period of Extrinsic Incubation of Yellow Fever" placed him among the immortal physicians, along with Finlay, Lazear, Reed and Agramonte, et al., who demonstrated the mosquito transmission of yellow fever, upon which was based Gorgas' work that resulted in freeing Havana from that disease for the first time in a century, and also upon which depended the sanitation of the Canal Zone.

Surgeon-General Gorgas delights to speak of Carter as one of the "great pioneers in malaria and yellow fever work," and Walter Reed, in a personal letter, said: "Carter's work in Mississippi did more to impress me with the importance of an intermediate host in yellow fever than everything else put together."

A recent contribution of Carter, in a paper read before the Southern Medical Association, entitled "The Effect of Impounded Water on the Incidence of Malaria," and published in the SOUTHERN MEDICAL JOURNAL, March, 1915, announces new principles for the prevention of malaria that are of far-reaching importance in the development of the water power of our Southern streams.

Like most other great men, Assistant Surgeon-General Carter is as modest as he is distinguished, and the SOUTHERN MEDICAL JOURNAL delights to call attention to the achievements of such men. It, therefore, gives us pleasure to publish the following tribute to him, which was prepared at our request by one of his confreres:

Some Achievements of an Eminent American Sanitarian.

An Act of Congress, approved March 4, 1915, provided for the recognition of the services of certain officers of the Army, Navy, and Public Health Service in connection with the construction of the Panama Canal. Among those who were thus so signally honored was Assistant Surgeon-General Henry R. Carter. It is of interest at this time, therefore, to recall to mind some of the achievements of this scientific worker in American sanitation, especially in relation to malaria and yellow fever.

Dr. Carter was born in Virginia, where he received his early education. He pursued a scientific course at the University of Virginia, paying special attention to mathematics, and graduated in engineering in 1879. This technical training was invaluable to him in solving sanitary problems to which he devoted himself later in his career.

He graduated in medicine at the University of Maryland, and entered the Marine Hospital Service May 5, 1879. In the fall of the same year he saw his first cases of yellow fever. In January, 1888, he was ordered to Ship Island Quarantine Station in the Gulf of Mexico. This was the federal refuge station, to which came all vessels infected, or probably infected, with yellow fever bound for any Gulf port, except New Orleans, which handled her own infected vessels. Many of these were sailing vessels from Rio, Santos, Havana and Colon, which at that time were especially dangerous. Opportunity was thus afforded him not only to study a disease of far-reaching public health and economic importance, but to prevent its entrance into the country.

The conditions of work were difficult, however, owing to the fact that there were no definite and uniform regulations to serve as a guide. When one began to formulate regulations he was confronted with the absence of reliable data on which to found them. Although quarantine procedures were in operation at every tributary port from Appalachicola to Galveston, they were all different. In regard to disinfection, for instance, New Orleans laid most stress on steam disinfection of clothing and the disinfection of ballast with bichloride solution; Pensacola, with apparently little faith in any disinfection, laid stress on the discharge of ballast and the whitewashing of the hold of the vessel. Fortunately, all used sulphur fumigation.

The periods of detention in quarantine were also varied for each port of entry, and for New Orleans different for different ports of clearance. Nor was there any relation between the detention of the personnel aboard and the disinfection of the vessel, although all required detention and certain processes called disinfection. Moreover, the work of the station was valueless unless its pratique was accepted at the port of entry of the vessel bearing it, and in the past that had been far from universal.

It was necessary then (1) to find out what was necessary to make an efficient and reasonable quarantine, especially the minimal period of safe detention. (2) To gain the confidence of the boards of health of the gulf ports in the work of the station so that its pratique might always be accepted. (3) To induce the boards of health to waive the plainly unnecessary requirements; in other words, to bring about uniform quarantine requirements for the gulf ports. (4) To reduce to a minimum the expense to vessels on account of quarantine, and to increase the usefulness of the station by increasing its clientele.

From such data as he had Carter tentatively deduced that five days covered the maximum period of incubation of yellow fever, and made this his period of detention. He counted this period, however, from the completion of disinfection of the vessel—the last exposure of her personnel to infection. He also became convinced that sulphur fumigation by pots was sufficient by itself to destroy the infection of yellow fever aboard ships, although this method of treatment was looked upon as unreliable by other sanitarians of the time. Regulations having been issued to put in practice these and other facts, there was thus begun under his charge the present system of maritime quarantine by the service.

The radical innovation in the conduct of quarantine at Ship Island in 1888 was not in prescribing any special method of disinfection or in fixing any special period of detention for personnel, but in counting that period from the completion of disinfection of the vessel. At that time the regulations of all United States ports which quarantined against yellow fever dated the period of detention from "the date of leaving the last infected port," or "the date of arrival in quarantine." Not until after the federal regulations became mandatory was this principle universally applied in this country.

In order to determine the period of detention of personnel, it was necessary to know the period of incubation of yellow fever. On this point there were no satisfactory data. Carter accordingly set himself to determine it, taking this, if necessary, as his life's work. The work was completed only in 1901 twelve years afterwards.

While working on this, another very puzzling phenomenon presented itself. Just as there was a period of incubation in man which must be passed before the infection became manifest, so there seemed to be a period of time through which the ship must pass before its infection became manifest in the only way it is ever manifested—by being able to convey yellow fever to man. In other words, "after a ship becomes infected a considerable period of time must elapse before it becomes infective." Eleven to eighteen days was the first tentative determination.

We now know well what this means, but it introduced a very troublesome factor in his attempt to discover the period of incubation in man.

Indeed, it was a long time before Carter was able to formulate the above as an explanation of his observations. As these observations accumulated, he became convinced absolutely, but others competent to judge were not convinced. In fact, not until he had the data from the country epi-

demics of Orwood and Taylor, Miss., in 1898, did he have evidence which convinced other people. He used this principle, however, in the suppression of epidemics, especially at McHenry, Miss., in 1898, and elsewhere, and to a knowledge of it, the suppression of that epidemic was due.

The next notable service of Dr. Carter was in the Brunswick, Georgia, epidemic in 1893. On his report of conditions at the Brunswick Quarantine Station and recommendations, the control of this station was transferred to the United States under the Act of February 15, 1893. This was the first quarantine station to be thus transferred to the federal government, and the precedent thus set was a decided factor in similar action in regard to the stations of Fernandina, Savannah, Charleston and Pascagoula.

In 1890 Carter had proposed the disinfection of vessels from Cuban and Mexican ports at the port of departure, so that the time en route to the port of entry after such disinfection could count as observation of personnel and by so much lessen the time of the detention of the ship in quarantine. How this method has been developed there is no need to tell. It is the key to our maritime sanitation.

In the summer of 1897 yellow fever was reported at Ocean Springs. Carter was ordered to that point, where he was engaged in sanitary work until the disease was declared in New Orleans. He was then put in charge of the service work in Louisiana and Mississippi, except the Mississippi coast. This was to arrange for transportation from and through the fever infected districts and to assist the health authorities in preventing the further spread of the fever. The work was mainly pioneer work and the whole district and surrounding country was in a very unsettled and unsatisfactory state. Yet, on the whole, the work was smooth and successful. In this epidemic Carter, himself, contracted yellow fever.

Early in June, 1898, yellow fever was discovered at McHenry, Miss. Dr. Carter was detailed to assist the Mississippi State Board of Health in confining the disease to McHenry, and in eliminating it from that town. Vigorous measures were taken, for with yellow fever fairly epidemic in an inland town so early in the season the danger of a widespread epidemic was considered extreme. These measures were succcssful and the fever was eliminated from McHenry. This was the first epidemic of yellow fever to be suppressed in the South in the summer time.

Later in the summer yellow fever was reported at Franklin, La., then in Taylor, Orwood, and Jackson, Miss., and finally in New Orleans. Dr. Carter took charge of these outbreaks as they occurred, and finally of the infected district as a whole.

In January, 1899, he went to Cuba as Chief Quarantine Officer of the island, in charge of all maritime sanitation of Cuban ports for both incoming and outgoing vessels, except those of the Province of Santiago de Cuba. At Havana he was able, with a good fumigating plant, to put in operation on a large scale, the plan of disinfection at the port of departure and counting the time in transit as observation of personnel so as to have a brief period of detention, or none at all, of the personnel at the United States port of entry.

While in Cuba he also served on the Board for the Diagnosis of Yellow Fever, being associated on this board with Finlay, Gorgas, and Juan Guiteras. He occupied this position about eighteen months, although he spent the fall in the United States engaged in epidemic work at Key West, New Orleans, and Jackson, Miss.

Based on his observations during the epidemics at Taylor and Orwood, Miss., Carter wrote the brochure, "The Interval betwen Infecting and Secondary Cases of Yellow Fever," which led Reed and his coworkers to believe that yellow fever was conveyed by a host, and, as stated by them, led also to their experiments which proved it true.

The brochure, "Extrinsic Incubation of Yellow Fever," was written some months later.

As to the importance of Carter's observations, Reed and his coworkers made the following statement:

"We were also much impressed by the valuable observations made at Orwood and Taylor, Miss., during the year 1898, by Surgeon Henry R. Carter, United States Marine Hospital Service. (A note on the interval between infecting and secondary cases of yellow fever, etc., New Orleans Medical Journal, May, 1900.) We do not believe that sufficient importance has been accorded these painstaking and valuable data. We observe that the members of the yellow fever commission of the Liverpool School of Tropical Medicine, Drs. Durham and Myers, to whom we had the pleasure of submitting Carter's observations, have been equally impressed by their importance." (British Medical Journal, September 8, 1900, pp. 656-657.)

"The circumstances under which Carter worked were favorable for recording with considerable accuracy the interval between the time of arrival of infecting cases in isolated farmhouses and the occurrence of secondary cases in these houses. According to Carter, 'the period from the first (infecting) case to the first group of cases infected at these houses is generally from two to three weeks.'"

"The houses having now become infected, susceptible individuals therafter visiting the houses for a few hours fall sick with the disease in the usual period of incubation—one to seven days."

"Other observations made by us since our arrival confirmed Carter's conclusion, thus pointing, as it seemed to us, to the presence of an intermediate host, such as the mosquito, which, having taken the parasite into its stomach soon after the entrance of the patient into the noninfected house, was able after a certain interval to reconvey the infecting agent to other individuals, thereby converting a noninfected house into an "infected" house. This interval would appear to be from nine to sixteen days (allowing for the period of incubation), which agrees fairly closely with the time required for the passage of the malarial parasite from the stomach of the mosquito to its salivary glands."

In December, 1904, Dr. Carter was detailed for duty at Panama, where he organized the quarantine service and later served as Director of Hospitals. He remained with the Panama Canal Commission for over five years, and was concerned with much of the organization and early work on the isthmus.

Major Ronald Ross, himself a recipient of the Nobel Prize, presented Carter's name conjointly with that of Finlay for this honor on the ground that the work done on the extrinsic incubation of yellow fever was the foundation on which the work of Reed and his colleagues rested and gave the clue which led them to make the direct experiments which produced such brilliant results.

The vast experience had in hospital, quarantine, and epidemic work by Dr. Carter in the United States, Cuba, and the Canal Zone has been of value not only in his studies of yellow fever but in malaria suppression. Since returning from duty at the latter place he has accordingly given special attention to the bearing of impounding reservoirs on the incidence of malaria and enunciated certain principles which will be far-reaching from both public health and economic standpoints.

In a word, then, the most notable of Carter's achievements as a scientist and sanitarian may be summarized as follows:

1. The determination of the period of extrinsic incubation of yellow fever.

2. The institution of a rational relation between the disinfection of vessels and the detention of their personnel, permitting the fixing of minimum periods of detention in quarantine.

3. The encouragement of uniformity in quarantine practice, resulting in the adoption of a system of Federal quarantine regulations.

4. The transfer of the Brunswick, Georgia, quarantine station to the Federal Government, the first state or municipal quarantine to be thus surrendered.

5. The control of numerous yellow fever epidemics in the Southern States, and especially that of McHenry, Miss., which was the first epidemic of yellow fever to be suppressed in the South in the summer time.

6. The inauguration of the quarantine systems of Cuba and the Canal Zone.

7. The enunciation of principles relating to the bearing of impounding reservoirs on malaria incidence.

CORRESPONDENCE

Washington, D. C., May 11, 1915.

Editor Southern Medical Journal:

The Association of the Medical Reserve Corps, U. S. Army, New York State Division, having established the "Gorgas Prize Medal," to be awarded yearly, I request that the enclosed announcement of the Board of Award, Gorgas Prize Medal, be published in your journal.

Yours very truly,

CHAS. RICHARD,

Colonel, Medical Corps, U. S. Army, President, Board of Award, Gorgas Prize Medal.

Gorgas Prize Medal.

Referring to the Gorgas Prize Medal, to be awarded yearly by the Association of Medical Reserve Corps, U. S. Army, New York State Division, the Board of Award makes the following announcement:

The competition is open to medical officers of the army, officers of the Medical Reserve Corps of the army, and medical officers of the organized militia.

The medal will be awarded for the paper submitted which shows the most important advance in medicine or surgery on a medical or medico-military subject, preference being given to papers on a medico-military subject.

The medal will be awarded only for papers of exceptional value.

The Board of Award consists of three members of the Faculty of the Army Medical School, appointed by the Surgeon-General, U. S. Army.

The papers should be submitted to the Board of Award, Gorgas Prize Medal, by March 31st of each year, and should be addressed to the President of the Board of Award, Gorgas Prize Medal, Army Medical School, Washington, D. C.

The award will be announced at the graduation exercises of the Army Medical School, on May 31st of each year.

BOOK REVIEWS

The Holden System for the Medical Man.

An inexpensive but efficient card index for the doctor whereon in a convenient, reliable, up-to-date manner he may record in a condensed, accessible form, every element of his professional connection with his patients. One card properly ruled, will carry the financial items of a single person or family for months. Another card records the "History and Therapy" of the cases, and is duplicated as required. Form 3 is a chart of physical signs. Chart 4 is for urinalysis. Form 5 is a temperature chart. Forms 6 and 7, obstetric data. Form 9, infant feeding. Form 10, surgical treatment. The cards are 4" by 6" in size and of different colors. All record cards are filed between heavier guide cards with lettered tabs, and should be kept in a filing drawer. A booklet giving detailed information accompanies the cards. On the whole it is a simple but comprehensive system. The Holden System, P. O. Box 351, Yonkers, N. Y.

Modern Medicine.

Its Theory and Practice. In original contributions by American and foreign authors. Edited by Sir William Osler, M.D., F.R.S., Regius Professor of Medicine in Oxford University, England; formerly Professor of Medicine in Johns Hopkins University, Baltimore; in the University of Pennsylvania, Philadelphia, and in McGill University, Montreal; and Thomas McCrae, M.D., Professor of Medicine in the Jefferson Medical College, Philadelphia; Fellow of the Royal College of Physicians, London; formerly Associate Professor of Medicine in Johns Hopkins University, Baltimore. In five octavo volumes of about 1,000 pages each. Volume IV. Diseases of the Circulatory System; Diseases of the Blood; Diseases of the Lymphatic System; Diseases of the Ductless Glands; Vasomotor and Trophic Disorders. Just ready. Price per volume, cloth, $5.00, net; half morocco, $7.00, net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

As a general rule this reviewer has little faith in the continued usefulness of so-called "systems of medicine." The shelves of many a library are cumbered with rows of such volumes, imposing in appearance and originally expensive, but seldom consulted after the first few months of their existence.

The amazing rapidity with which new knowledge is developed has rendered them mainly obsolete. "Modern Medicine" is different. The volume under consideration is crowded with facts instead of theories, facts dug out of the exhaustless mine of the eternal verities by the aid of the wonderfully precise instruments now at the service of scientific research. An effort to present to our readers, within the space allowed for a review, an adequate conception of its contents would be futile. Dealing as it does with diseases of the circulatory system it necessarily presents first their normal physiology, before taking up that which is disordered, or diverted from a normal course. These matters are presented in a form so attractive in language, so lucid and classical, that the mere reading of it is a delight. Osler's writings have been accused of giving too little attention to treatment. Such a reproach cannot be truthfully applied to Volume IV, for it gives in adequate detail the medical, dietetic, physiological and surgical treatment of the many forms of disordered or diseased tissues or functions described. It is evident, however, that his faith in medication is small.

It is in his diagnostic profundity that the genius of Osler shines brightest, and though Modern Medicine is a composite construction of the views of many minds, yet the mind of the master shines through the whole.

Mental Medicine and Nursing.

By Robert Howland Chase, A.M., M.D. Physician in Chief, Friends' Asylum for Insane, etc., Philadelphia. Philadelphia and London. J. B. Lippincott & Company.

This is a book for use in training schools for nurses, in medical colleges, and for reference by the general practitioner. It contains 244 pages and 76 illustrations. It is in reality an introduction to the study of mental diseases. As such it seems a concise and practical presentation of the symptomatology of the different forms of mental disorder in various stages. The likenesses of the faces of patients suffering with forms of paranoia, melancholia, manias and delusions are impressive and instructive. The book is well calculated to achieve its declared purpose of introducing "the study of mental diseases."

Hand Book of Pharmacology.

By Charles W. Greene, A.B., A.M., Ph.D. Octavo, 420 pages, illustrated by 70 engravings in black and colors. Extra muslin, $3.50, net. Wm. Wood & Co., Publishers, New York.

The chief difference between this book and many other works on pharmacology is that it confines its teachings strictly to the subjects properly included in its title and does not try to precede them with a treatise on materia medica nor follow them with a dissertation of therapeutics. Consequently it is able to present the subject of pharmacology thoroughly and well, and yet hold the size of the book down to a convenient weight and thickness for handling. The usual grouping of drugs is generally followed, such as "the Opium Series," the "Strychnine Group," and so on. The pharmacological actions are carefully stated, but there are no detailed instructions for laboratory experiments. To those who believe the prominence given in some medical schools to laboratory demonstrations in pharmacology is excessive and unnecessary, sometimes even diverting attention from the clinical studies that should predominate in the study of medicine, this circumstance will be a recommendation. No teacher who believes in extended laboratory work on lower animals as a demonstration of printed

truths will approve of this book. Teachers who are satisfied with the question and answer method of instruction will like it.

Chemistry and Toxicology for Nurses.

By Philip Asher, Ph.G., M.D., Dean and Professor of Chemistry at the New Orleans College of Pharmacy. 12mo of 190 pages. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, $1.25, net.

The above is a small, neat volume, rather cheaply constructed. It contains a tolerably fair presentation of the elementary facts of chemistry, condensed to the limit of clarity. No doubt it will be useful to girls and women beginning their course of study preparatory to becoming professional nurses.

According to the judgment of the reviewer, it should be sold at half the advertised price, but to one who needs such instruction it may be worth double what is asked for it, for though condensed its paragraphs convey accurate statements, so far as a cursory examination discloses. It should serve a good purpose.

SOUTHERN MEDICAL NEWS

ALABAMA.

The annual meeting of the Medical Association of the State of Alabama was held in Birmingham during the four days beginning April 20th. The following officers were elected: President, J. N. Baker, of Montgomery; Vice-Presidents, E. B. Ward, of Selma, and A. N. Steele, of Anniston; Treasurer, J. U. Ray, of Woodstock. The next annual meeting will be held at Mobile. About 650 doctors were registered.

At Mobile the County Medical Society has received from Mrs. Duke W. Goodman, widow of the late Dr. Duke W. Goodman, a portrait of her deceased husband. The picture was accepted by the society and hung in the meeting hall at Conception and St. Michael Streets. Dr. Goodman had served as president, as vice-president and as secretary of the society.

The misunderstanding between the School of Medicine of the University of Alabama, situated at Mobile, and the authorities of the Mobile City Hospital, which at one time seemed to so threaten clinical facilities that the school could not retain its position in class A, has been completely and amicably composed, so that the clinical facilities are ample. Over a thousand cases in the outdoor department alone are treated by the senior students every month.

At the meeting of the State Association the laws were so amended as to cause the number of delegates from each county to be the same as the number of representatives such counties are entitled to in the State Legislature.

At Birmingham a quarantine ordinance makes persons under 15 years of age liable to arrest and fine for leaving premises which are under quarantine for a contagious disease.

In Jefferson County during the month of April there were 8 homicides, 3 suicides and 23 accidental deaths.

At Tuscaloosa the fight on tuberculosis in the town and county is being pushed very satisfactorily by the anti-tuberculosis association. A nurse in their employment devotes her entire time to the work.

State Pathologist P. B. Moss has reported to Decatur that the water now furnished the Decaturs by the Decatur Water Supply Company is pure, following the chemical treatment of the water by the company.

At Birmingham the City Health Officer recommends that schools in whose grades scarlet fever has developed shall be quarantined for at least ten days.

Dr. J. E. Robbins has been appointed by Governor Henderson as State Physician at Banner mines.

Surgeon Paul Preble, of the U. S. Public Health Service, declares that in his opinion the typhoid fever at Florence is caused by a polluted water supply, and that sand filtration would be the remedy.

Deaths.

At Elba, February 10th, Dr. Henry R. Bradley died at his home.

Dr. Frank B. Stallsworth, a graduate of the University of Alabama, died at his home in Cuba, Ala., January 2nd.

ARKANSAS.

At Jonesboro, in April, Dr. Olive Wilson, of Paragould, lectured at the high school and four ward schools on sanitation. She came at the invitation of Dr. W. M. Jackson, City Health Officer.

At Texarkana Dr. J. K. Smith, who by the will of the late physician, Dr. Abell, was designated as the man to continue his work, has assumed the position of superintendent of the Abell sanitarium.

At Little Rock the first annual banquet of the Bentley-Dibrell Medical Society was held at the New Capital Hotel, April 22nd. The membership includes the entire student body of the Medical Department of the University of Arkansas. Dr. Morgan Smith, Dean of the school, was toastmaster.

At Batesville, April 23rd, Dr. J. C. Hughes, who was tried for the murder of Alf Bagley in 1910, was acquitted by the jury after brief deliberation.

At Little Rock word has been received that Dr. Ernest Winfield Scott, son of Dr. S. A. Scott, 2700 West Twelfth Street, has been appointed superintendent of the hospital at Stapleton, N. Y., under the administration of the U. S. Public Health Service. He has been superintendent of the U. S. Marine Hospital at Wilmington, N. C.

At Pine Bluff Dr. W. T. Lowe resigned his position as city physician.

At Little Rock, April 8th, the Medical Depart-

ment of the University of Arkansas was partially destroyed by fire. It was situated on the second floor of the old state house building. The damage to the laboratory is estimated at between $8,000 and $10,000, partially covered by insurance. The work of the school was not interrupted.

Deaths.

At Hot Springs, in April, Dr. W. J. McDonald, formerly of Texas, died at his home.

DISTRICT OF COLUMBIA.

Dr. Archibald M. Fauntleroy, a surgeon who has been attached to the naval hospital, has been designated by Secretary Daniels to make an observation tour of the war hospitals of France, Belgium and England.

Passed Assistant Surgeon R. M. Grimm, U. S. Public Health Service, has been relieved from duty at the Hygienic Laboratory in Washington, and has gone to Spartanburg, N. C., to take charge of the pellagra hospital there.

The District Commissioners have filled four vacancies on the board of medical examiners of the District, as follows: Drs. Edgar Snowden, Edgar P. Copeland, Edward Hiram Reede, and Harry Hyland Kerr. The retiring members are Drs. James F. Mitchell, D. S. Lamb, Frank Leech, and J. B. Nichols.

Deaths.

At Washington, March 27th, Dr. Francis D. Koonce died at his home, 900 M. St., from pneumonia. His age was 46 years.

FLORIDA.

At Tallahassee, April 17th, Dr. Oscar Dowling, of the Louisiana State Board of Health, addressed the members of the Florida Legislature in the House of Representatives, urging the adoption of certain legislation advocated by Dr. J. Y. Porter, State Health Officer of Florida.

At Orlando, April 16th, at a meeting of the city council, the resignation of Dr. P. P. Pillans as city physician was accepted, and the City Board of Health was requested to recommend another physician to take his place.

The newly elected members of the Gainsville Board of Health are: Col. W. L. Hill, B. F. Miller, and Prof. W. L. Willoghby. The board met and elected Col. Hill, President; Mr. Miller, Vice-President, and Dr. J. H. Colson, Secretary.

The local physicians in and around Jacksonville supported the bill in the legislature prohibiting the sale of habit-forming drugs and providing for the treatment of drug addicts.

The State Board of Health is supplying vaccine points gratuitously to health officers throughout the state when applied for. Health officers everywhere are urging the people to be vaccinated.

Deaths.

At Jacksonville, April 11th, Dr. Richard P. Daniel died at his home, aged 87 years. He was a Confederate veteran and the first President of the Florida State Board of Health.

At Jacksonville, March 27th, Dr. Alfred H. Garnett died, aged 66 years.

GEORGIA.

At Donaldsonville, April 12th, Dr. J. L. Adams was shot and fatally wounded by a man named Jim Yates, a person who had previously killed another man and been sentenced to the penitentiary for life, but pardoned by Governor Hoke Smith after serving one year.

Dr. William Walter Young, formerly of Richmond, Va., has located in Atlanta.

The senior class of the State Medical College, at Augusta, spent a week in April at the State Sanitarium, in Milledgeville, inspecting the work of the institution. Their studies were directed to the mental and nervous diseases treated there.

County physicians in Georgia who failed to apply for examination papers to qualify for their positions before May 1st will forfeit them, unless they make a special trip to Atlanta and apply personally before the State Board of Health. Each county is now allowed to employ a "health doctor," who must stand a competitive examination for the place.

At the meeting of the Medical Association of Georgia, at Macon, April 20-24, the following officers were elected: President, W. S. Goldsmith, Atlanta; Vice-President, O. H. Weaver, of Macon; Secretary, W. C. Lyle, of Augusta. Columbus was selected as the next place of meeting.

In Atlanta the citizens have organized a "Mosquito Squad" for a lively campaign this spring. Two members will make a house-to-house canvass, and delinquents will be reported to the recorder. Four members of the squad will be equipped with oil carts and will tour the city to sprinkle pools and ponds.

At Savannah, April 23rd, the steamship Powhatan, from Baltimore, put in flying the quarantine flag, and reported a case of smallpox on board. Before the ship was allowed to proceed or anyone was allowed to land every person on board was obliged to submit to vaccination.

Deaths.

At Atlanta, April 24th, Dr. William M. McAfee died suddenly of apoplexy.

At Louisville, Ga., April 14th, Dr. J. D. Wright died at his home, aged 50 years.

At Blakely Dr. Thomas E. Sheffield, aged 38 years, was shot and killed by his wife near his office. Jealousy is supposed to have been the cause.

At Maysville, March 17th, Dr. M. P. Alexander died at his home, aged 85 years.

At Fayetteville, January 27th, Dr. Robert K. Dixon died at his home, aged 30 years.

At Brunswick, March 19th, Dr. Alexander H. Scott died at his home from heart disease, aged 74 years.

At Fairburn, March 16th, Dr. R. L. Swanson died, aged 25 years.

At Atlanta, March 26th, Dr. Edgar L. Hawley died at his home, aged 50 years.

KENTUCKY.

On April 17th reports from Jackson indicated that the smallpox situation at Quicksand was being gotten under control, only five new cases having been found on the preceding day. The epidemic did not spread beyond the town limits.

(Continued on page xx.)

This is the first of a series of articles on the uses of Stanolax Liquid Paraffin.

The facts presented in this series of announcements are based on authoritative clinical data.

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Announcement

The research laboratories of the Standard Oil Company (Indiana), Chicago, U. S. A., have produced from American Petroleum a neutral, bland, tasteless, odorless liquid paraffin that is equal to any and superior to most of the mineral oils which have been offered for internal use, whether of European or domestic origin.

This liquid paraffin, made to conform to the exacting requirements of the medical profession, will be marketed under the trade name of

Stanolax Liquid Paraffin

for the protection of physicians who recognize the necessity for a dependable product.

STANOLAX is an intestinal lubricant and protective agent, and its use is not followed by artificial stimulus of peristalsis.

It's especially indicated in the treatment of chronic constipation and intestinal stasis. Its action is purely mechanical.

It is not absorbed and does not digest.

Bastedo, W. A. (Jour. A. M. A. LXIII, No. 9, August 29, 1914) says: "Liquid paraffin (petrolatum liquidum) is a remedy that has been extensively employed since it was called to the notice of the profession by Sir Arbuthnot Lane. It is a viscous liquid that is not at all changed chemically by the intestinal secretions nor absorbed from the alimentary tract, as shown by Bradley, 1911, and by Bloor, 1913. By its action as a lubricant it serves to soften and to increase its bulk. It is also believed to be strictly non-irritant. Whether or not it exerts in the bowel a disinfectant on some of the strains of fecal bacteria has not been demonstrated. Finch and others have shown that it lacks disinfectant effect, but that by virtue of its viscous and oily nature, it acts as an agent which retards the growth of bacteria implanted in it, but this does not serve as a test of its antibacterial value when mixed with food residue in the ileum or colon."

* * * * *

A trial quantity and fully descriptive booklet will be sent gladly on request.

STANDARD OIL COMPANY
(INDIANA)
CHICAGO, U. S. A.

(351)

(Continued from page 550.)

At Cloverport, April 6th, five cases of scarlet fever and one of diphtheria were discovered.

At Mayfield the Graves County Medical Society elected the following officers: President, J. C. Sullivan; Vice-President, Stanley Mullins; Treasurer G. T. Fuller; Secretary, H. H. Hunt.

At Lexington, in April, measles and whooping cough prevailed extensively. There was also some scarlet fever.

Under a new law in Kentucky, recently proclaimed in force, no person outside the immediate relatives, the minister, undertaker and assistants can enter a building where there is a death from cholera, bubonic plague, typhoid fever, yellow fever, smallpox, diphtheria, membraneous croup, scarlet fever, or cerebro-spinal fever. In such cases the burials must be private, and there can be no church funerals.

At Louisville City Health Officer Dr. W. Ed Grant, has notified all meat dealers that they must either have their meats screened this summer or keep them in the ice boxes. Otherwise they will not be allowed to sell them. He has also issued a request for the co-operation of housewives in the enforcement of the meat inspection laws. The new meat ordinance requires that all meat sold in Louisville must be stamped by either the city or government inspectors.

At Louisville, in April, Dr. Thomas L. Harris was appointed chief resident physician of the city hospital to succeed Dr. James Bruce. He was recommended to the Board of Public Safety by the trustees of the University of Louisville.

Deaths.

At Morgantown, April 10th, Dr. Emmett James was found dead in his bed at five o'clock p.m. His age was 47 years. It is thought he accidentally inhaled too much chloroform in an effort to secure sleep.

At Sebree, April 14th, Dr. C. L. Edwards, of Webster County, died two miles from town while making a professional call. Arrived at the home of his patient he told them he was ill and to get another doctor. He expired in a few minutes. His age was 51 years.

At Washington, Ky., Dr. Alex. Hunter died April 12th of pneumonia. His age was 72 years.

At Louisville, April 20th, Dr. Peter Schwemberger died at the home of his daughter, Mrs. Amelia Yermann, 1822 Division St., New Albany, at the age of 94 years.

At Louisville, April 10th, Dr. Chester Alfred Mayer died at the Russell Sanatorium of paralysis. His age was 58 years. He leaves a widow and one daughter.

At Mt. Sterling, April 13th, Dr. John L. Brown died at his home of paralysis, aged 51 years.

At Lewisport, April 12th, Dr. Albert Griffin died at his home after a lingering illness, aged 75 years.

LOUISIANA.

Surgeon J. M. Gillespie, U. S. Public Health Service, who has been stationed in New Orleans since the beginning of the plague campaign, has been transferred to Chicago, and left for that city April 17th.

At New Orleans W. T. O'Reilly, of the City Board of Health, was elected chairman, and Dr. Sara T. Mayo was re-elected secretary, of the Sickles Fund Commission. The fund now affords about $10,000 a year to be spent in supplying prescriptions and medicines for the poor.

Dr. W. J. Gilbert, of New Orleans, was married to Mrs. Bertha Wilken, of Gulfport, Thursday, April 22nd.

The improvement in conditions at the city hospital for mental diseases since that institution has fallen to the care of Dr. E. L. Hummel is highly commended by Mayor Behrman. The quarterly report shows that 61 persons were discharged from the hospital as cured. This is probably the largest percentage of cures in the history of the institution in any similar period of time.

At Jonesville a board of health has been organized with the following officers: President, Dr. H. S. Bennett; Secretary, Dr. E. I. Yancey; Treasurer, W. C. Lanier; Members, J. R. Boyd and C. C. Randall.

At a recent meeting of the Vermilion Parish Medical Society, resolutions were unanimously adopted approving the campaign which the U. S. Government, Post Office Department, and the Louisiana State Board of Health are waging against such nostrums as Wine of Cardui, Swamp Root, Syrup of Figs, Mothers' Friend, Vitalitas, and like preparations, and pledging their active support in the campaign.

The annual meeting of the Louisiana State Medical Association convened at Lake Charles for a three-day session April 20th. The following are the newly elected officers: Dr. J. C. Willis, President, Shreveport; Dr. T. H. Watkins, Lake Charles, Dr. Adolph Henriques, New Orleans, and Dr. J. M. Mosely, Arcadia, Vice-Presidents; Dr. L. R. DeBuys, Secretary-Treasurer, New Orleans.

The Railway Surgeons' Association of Mississippi and Louisiana held their annual meeting at Lake Charles on April 22nd. The following are the newly elected officers: Dr. Charles McVea, President, Baton Rouge; Dr. M., L. Hoffpauer, Crowley, and Dr. I. W. Cooper, Newton, Miss., Vice-Presidents; Dr. J. J. Robert, Baton Rouge, Secretary; Dr. P. T. Talbot, New Orleans, Treasurer.

The St. Charles Press of April 20th states that Calcasieu Parish is now entirely free from smallpox. It attributes the checking of the disease to the general vaccination of school children last fall.

MARYLAND.

At Baltimore, April 26th, two medical students, in trying to cure a painful toe-nail on the foot of a patient, prescribed novocain. Dr. George Kries, a drug clerk, to whom they presented the prescription, refused to fill it because they were not registered physicians and notified the police. They were carried before Justice Schirm, who was about to administer a fine when Dr. Edwards, an instructor at the university, convinced him that the prescription was regular and justified, and they were released.

At Elkton, April 21st, the Cecil County Medical Society held its annual meeting and elected the

(Continued on page xxii.)

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2 Or his estate is sued, whether the act or omission was his own
3 Or that of any other person (not necessarily an assistant or agent)
4 All such claims arising in suits involving the collection of professional fees
5 All claims arising in autopsies, inquests and in the prescribing and handling of drugs and medicines.
6 Defense through the court of last resort and until all legal remedies are exhausted
7 Without limit as to amount expended.
8 You have a voice in the selection of local counsel.
9 If we lose, we pay to amount specified, in addition to the unlimited defense.
10 The only contract containing all the above features and which is protection per se. *A sample upon request.*

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Professional Protection, Exclusively

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Suggest this dainty dish.

Pettijohn's is whole soft wheat, flaked much like Quaker Oats. For 20 years, in countless homes, it has been the favorite morning cereal.

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We will mail to any physician a full-size package for testing at home or with patients. Please ask us for it.

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Chicago, Ill. (942)

(Continued from page xx.)

following officers: President, William D. Cawley; Vice-President, Charles F. Miller; Secretary-Treasurer, Howard Bratton.

At Baltimore, April 27th, a large oil portrait of the late Dr. William Travis Howard, professor of the diseases of women at the University of Maryland from 1867 to 1897, was unveiled in Osler Hall as a presentation to the Medical and Chirurgical Faculty of Maryland, which opened its one hundred and seventeenth annual meeting at that date. It was presented by the widow of Dr. Howard. The artist is Thomas Corner.

The governing body of the society nominated for next year is as follows: President, Dr. G. W. Williams; Vice-Presidents, Drs. L. C. Carrico, M. D. Norris and J. A. Chatard; Secretary, Dr. J. L. France; Treasurer, Dr. W. S. Gardner. For the State Board of Medical Examiners, Drs. J. L. Riley, L. A. Griffith, A. H. Hawkins, H. G. Simpers and C. N. Smith.

At Hagarstown, Dr. D. A. Watkins, City Health Officer, announces the presence of smallpox. He believes the cause was the failure of certain physicians to recognize the disease and mistake it for chickenpox. One patient is only 17 days old, while another is 81 years. Most of the cases are very mild. They are about 12 in number.

In Frederic County, April 28th, the foot and mouth disease has made its appearance on the farm of W. H. McKimmey, near Greenfield Mills, in the lower end of the county, where a number of cases developed last November, and all the live stock except the horses was destroyed by order of the government.

At the Maryland House of Correction, Baltimore, where there are 800 inmates, an epidemic of erysipelas broke out, and soon 8 cases were diagnosed. The epidemic was controlled without loss of life.

Deaths.

At Baltimore, April 12th, Dr. John L. Perry died at the residence of his sister, Mrs. J. Charles Linthicum, 705 St. Paul St. His age was 75 years.

At Chestertown, April 14th, Dr. Horace W. Nicholson died at the home of his father from rheumatism of the heart.

At Baltimore, April 3rd, Dr. Robert K. Kneass died at his home, 1001 West Lanvale Street, of pneumonia. His age was 60 years.

At Baltimore, April 26th, Dr. William Becker, proprietor of a medical museum, died at his home, 708 East Baltimore Street. His age was 71 years. He had been confined to his room four years as the result of a stroke of apoplexy.

MISSISSIPPI.

Dr. Dunbar Rowland, of Jackson, has been elected president of the Mississippi Valley Historical Society.

A number of the cities in this state entered into a contest to see which should be declared the cleanest city on a certain date. A great deal of cleaning and painting ensued. The decision has not been reported to this office.

Dr. Willis Walley, State Sanitary Inspector, is rigidly enforcing the law requiring meats and other foods to be screened and all places exposing such for sale kept in a sanitary condition. In one day, in Jackson, it is reported that he swore out twenty affidavits against barbers, grocers, restaurants, etc. He promises to clean up some of the filthy negro dives that he says exist in Jackson.

At Meridian, the Tuberculosis Association of Lauderdale County held an interesting meeting and made plans for further extension of the camp work. The resignation of Dr. T. D. Bourdeaux, as hospital physician, was accepted, and Dr. R. M. Leigh was elected to fill the vacancy.

Dr. C. D. Davis, formerly of Houston, is now located at Okolona.

The annual meeting of the Mississippi State Medical Association was held at Hattiesburg, May 11 to 13. The following are the newly elected officers: Dr. I. W. Cooper, Newton, President; Dr. W. D. Scudder, Mayersville, Dr. W. L. Orr, Fulton, and Dr. J. W. Lucas, Moorhead, Vice-Presidents; Dr. E. F. Howard, Vicksburg, Secretary. Greenville was chosen as the next meeting place.

Deaths.

At Crystal Springs, April 13th, Dr. P. P. Lockwood, aged 76 years, died at his home. He was prominent in the work of the Crystal Springs Chautauqua.

NORTH CAROLINA.

The physicians and surgeons of Catawba County have organized a County Medical Society, and elected Dr. George H. West President and Dr. George W. Shipp Secretary and Treasurer. It is said that with a single exception every doctor in the county has signified his support of the organization.

At Asheville, April 20th, Dr. M. C. Roberts, of a nearby hamlet, was arraigned in a magistrate's court for failing to register the births of infants. The charge was preferred by E. S. Armfield, of the Bureau of Vital Statistics.

The Boy Scouts of Asheville have taken an active part in the clean-up campaign. They distributed the entire town into military districts and their work is remarkably efficient.

Dr. G. M. Cooper, whole-time health officer of Sampson County, became a member of the official staff of the State Board of Health, as Chief of the Bureau of Rural Sanitation and Assistant Secretary, May 1, 1915.

According to Dr. W. A. Evans, North Carolina is at the bottom of the list of states as regards typhoid fever. A bulletin of the State Board of Health gives the typhoid death rate at 57.4, when it should be, to meet the general average, 17.9 per hundred thousand.

At Raleigh health work on an intensive and extensive scale is the plan which Dr. J. L. McCullers, County Health Officer, laid before the County Commission. He asked for money to establish six anti-typhoid vaccine dispensaries in the county to immunize those persons who desire it free of charge.

Dr. R. E. Lee has moved from Goldsboro to Clinton.

(Continued on page xxiv.)

Immunize
4th of July Wounds
with
Tetanus Antitoxin

The following rules for the prevention of tetanus are from an editorial in the Journal of the American Medical Association, 1909, page 954:

"1. Freely incise every wound.

"2. Carefully and thoroughly remove from the wound every particle of foreign matter.

"3. Cauterize the wound thoroughly with Tincture of Iodine.

"4. Apply a loose wet boric acid pack.

"5. **Inject subcutaneously 1500 units antitetanic serum (Tetanus Antitoxin).**

"6. In no case should the wound be closed; it should be allowed to heal by granulation. The dressing and packing should be removed every day."

The Mulford Tetanus Antitoxin is Furnished in Improved Glass Syringes and May be Supplied by All Prominent Pharmacists

1500 units (immunizing dose); 3000 and 5000 units (therapeutic doses).

Mulford "First Aid" Ampuls
Prevent Wound Infections

(Patent applied for)

Break glass tube inside the rubber covering by bearing down sidewise.

First break off here to admit air.

The Mulford "First Aid" Iodine Ampuls, containing 3 1-2 per cent solution of Iodine, protect wounded or abraded surfaces immediately with this most effective antiseptic.

They are effective and easy to use.

Supplied in packages of 10 ampuls. Sample ampul mailed upon request.

Instruct your druggist to place these emergency remedies in stock.

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(Continued from page xxii.)

Deaths.

At Burgaw, April 10th, Dr. H. B. Thomas died at his home from pneumonia.

At Faison, April 21st, Dr. John M. Faison died at his home as the result of a self-inflicted gunshot wound. His age was 55 years.

At Asheville, April 18th, Dr. Frank H. Holmes died at the age of 45 years.

At Morganton, April 1st, Dr. Charles G. Ross died of pneumonia, aged 52 years.

OKLAHOMA.

The members of the State Medical Examining Board are: Dr. M. Long, Mountain View; Dr. LeRoy Long, McAlester; Dr. B. L. Denison, Garvin; Dr. E. B. Dunlap, Lawton; Dr. R. V. Smith, Tulsa; Dr. W. T. Ray, Gould; Dr. W. LeRoy Vonnell, Chickasha; Dr. H. C. Montague, Muskogee; Dr. O. R. Gregg, Alva.

The State Board of Health will have no funds available until after June 30th, though new duties are imposed upon it by the legislature. Eight new drug, food and sanitary inspectors at a salary of $1,200 each a year are provided to do the inspection work as soon as the funds are available.

Dr. Ralph V. Smith, of Tulsa, recently appointed to the State Board of Medical Examiners, will act as secretary of the board. The files and records of the office are moved from Guthrie to Tulsa, and all certificates entitling physicians to practice in the state are now issued from Tulsa. The next examination will be held in July.

The Louisiana health cars, known as "Health on Wheels," were sent to Muskogee for inspection by the Southern Commercial Congress, and were visited by large numbers of interested spectators. Dr. Dowling presided and pointed out the many educational features of the enterprise.

Dr. J. G. Street, Oklahoma City, was recently elected Commissioner on Public Property.

Dr. W. W. Boodie, of Tulsa, has been appointed county physician of Tulsa County.

The state legislature appropriated $25,000 for new fire-proof wards in the hospital at Supply. It also appropriated $50,000 for fire-proof cottages for the state's tubercular patients. It also appropriated $100,000 for the purchase of the Norman Sanitarium for the insane.

Dr. W. E. Wright and Dr. C. D. O'Hern have bought out the interest of Dr. G. H. Butler in the Physicians and Surgeons Hospital, at Tulsa.

Death.

At Oklahoma City, February 22nd, Dr. M. R. Collison died of pneumonia, aged 65 years.

SOUTH CAROLINA.

At Greenville the health department has resolved to fumigate all the moving picture houses in the city every Sunday. Where compliance is refused the police are instructed to close the houses until the fumigation is done. The amount of material will be either eight pints of formalin and four pounds of potassium permanganate, or their equivalent in other methods. The expense of fumigation is borne by the owners or occupants of the buildings.

The 67th annual meeting of the South Carolina Medical Association was convened at Greenwood April 20th, President Edward F. Parker, of Charleston, presiding. The first session was occupied by reports. The second session was called to order in the forenoon but adjourned shortly afterward on account of the sudden death of Dr. S. L. Swygert in the hall, which caused a complete change of the plans and programme. At a subsequent session. The following officers were elected: Dr. G. A. Neuffer, Abbeville, President; Dr. R. B. Epting, Greenwood, Dr. J. J. Cleckley, Bamberg, and Dr. D. A. Coleman, Blackstork, Vice-Presidents; Dr. E. A. Hines, Anderson, Secretary-Treasurer. Charleston was chosen as the next meeting place.

At Charleston, Governor Manning, acting President of the Medical College of South Carolina, was notified in April that Mrs. Salina Huger, widow of the late William H. Huger, M.D., had presented to the college $1,000 for the purpose "of serving the public welfare and ministering to the suffering and affliction of little children."

At Columbia the practicing physicians of the state sent in their reports, showing that there were 177 cases of pneumonia during March. There were 38 cases of pellagra, 68 of malaria, and 120 of whooping cough.

The Chesterfield County Medical Society was reorganized at a meeting held at Cheraw April 20th. Officers elected were: Dr. L. E. Bull, President, Cheraw; Dr. H. N. King, Vice-President, McBell, and Dr. T. E. Wannamaker, Jr., Secretary-Treasurer, Cheraw.

Deaths.

At Mobile, Ala., while on his way home from Tuscon, Dr. Judson E. Hair, Jr., of Greenville, died, aged 26 years.

At Fountain Inn, March 23rd, Dr. Samuel S. Knight died at his home, aged 77 years.

TENNESSEE.

The State Board of Control announced in April the appointment of Dr. Leonard W. Edwards, of Nashville, as prison physician at the Penitentiary.

At Clarksville, April 7th, it was announced that five children of the Odd Fellows Home family were ill with typhoid fever of a mild grade. The water used comes from springs, and had been pronounced free of impure matter. Dr. William Litterer, State Bacteriologist, visited Clarksville to investigate the outbreak. The water supply was found to be badly contaminated and was condemned.

At the closing session of the Tennessee Medical Association Dr. E. C. Ellett, of Memphis, was elected President; Dr. J. G. Price, of Dyersburg, Vice-President for West Tennessee; Dr. R. E. Lee Smith, of Doyle, Vice-President for Middle Tennessee; Dr. J. W. Johnson, of Chattanooga, Vice-President for East Tennessee; Dr. Olin West, of Nashville, Secretary, and Dr. C. N. Cowden, of Nashville, Treasurer and Trustee for two years of the association's journal. The next meeting will be at Knoxville.

Chancellor Hugh G. Kyle, of Rogersville, has made permanent the injunction against J. S. Anderson, the so-called "Indian doctor," of Kingston.

(Continued on page xxvi.)

GOODYEAR
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Try them, in fairness to yourself. Any dealer will supply you.

The Goodyear Tire & Rubber Company, Akron, Ohio

(2277)

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(Continued from page xxiv.)

This means that the famous Kingston "yarb" doctor will have to move out of the state if he practices.

Adjutant-General C. B. Rogan began on April 20th examining candidates for positions in the medical corps of the national guard of Tennessee.

At Clarksville, April 27th, while returning from Hopkinsville, Dr. J. A. B. Ward was severely injured by the overturning of his automobile down an embankment. His injuries were not fatal.

At Nashville, May 1st, Professor Irby Hudson, of Nashville; Professor J. W. S. Rhea, of Memphis, and Professor C. C. English, of Bristol, were appointed as the State Board of Examiners to examine applicants to practice medicine and ostheopathy as to their literary qualifications.

Dr. C. S. Stephenson, formerly of Centreville, is now an assistant surgeon, Medical Corps, United States Navy, and is now stationed at Cavite, Philippine Islands, but will shortly be transferred to China.

Dr. Vaulx Gibbs has returned to Chattanooga to resume practice, after being away more than a year.

Deaths.

At Bon Aqua, April 8th, Dr. J. N. Doyel died as the result of grip, at the age of 80 years.

At Linville, April 12th, Dr. J. M. Wright, an aged physician and ex-Confederate soldier, died at the home of his son, Dr. J. B. Wright. He is survived by his wife.

At Newbern, Dr. R. N. Fryer died at his home, aged 84 years. He is survived by one grandson, Edward F. King, of Los Angeles, California.

At Jackson, February 11th, Dr. D. C. Dickey died of nephritis, aged 88 years.

At Tate, March 19th, Dr. W. J. Heacker died at his home, aged 82 years. He was a Confederate surgeon.

Dr. A. M. Carter, a retired physician of Bristol, died suddenly at Winter Garden, Fla., of acute indigestion, an April 27th. His age was 71 years.

TEXAS.

The annual meeting of the Texas State Medical Association was held at Fort Worth, May 4-6. The following are the newly elected officers: Dr. J. M. Inge, Dention, President-elect; Dr. G. H. Moody, San Antonio, President; Dr. M. F. Bledsoe, Port Arthur, Dr. H. C. Black, Waco, and Dr. T. D. Frizzell, Quanah, Vice-Presidents; Dr. Holman Taylor, Fort Worth, Secretary. Galveston was chosen as the next meeting place.

At Dallas recently the candidates for the Sophomore Class of the College of Medicine, Baylor University, organized the "Sillman Biochemical Society," the object of the society being to follow up the relationships existing between medical sciences and chemistry and to stimulate investigation along the line of biological chemistry in general. The society has the indorsement of Dr. Cary, Dean of the College.

At Brownsville a quarantine was established against Mexico, to prevent the spread of smallpox and other diseases from the crowd of refugees. Those allowed to enter were first vaccinated.

At Wichita Falls the Northwest Texas Medical Association selected Mineral Wells as the next meeting place. The following officers were elected: President, Dr. J. H. Eastland; Vice-President, Dr. C. F. Young; Secretary, Dr. R. A. Duncan. About 200 physicians were present.

At Hightower, Liberty County, Dr. J. M. Hubert filed a petition in the United States district court asking to be adjudged bankrupt.

At Houston a free out-door patient department of the Baptist Sanitarium is giving free treatment to a large number of indigent sick. For the drugs, however, patients pay fifteen cents for each prescription. This removes the sense of charity and pays for the drugs.

At Fort Worth Dr. C. F. Hayes was reappointed city physician for the North Side.

The Frisco-Central Medical Society met at Dublin April 24th and elected the following officers: President, Dr. T. P. Weaver; Vice-President, Dr. J. J. Terrell; Secretary-Treasurer, Dr. J. D. Currie.

Dr. E. S. Cox, County Health Officer of Galveston County, will urge Governor Ferguson to submit the question of better provision for the insane of the state to the legislature at its next meeting. His object is to have such accommodations provided that the insane now kept in jails may have asylum accommodations.

On April 20th the Northeast Texas Medical Society met at Mt. Vernon. Its members are drawn from eleven counties and number about 200. Dr. C. A. Smith was President and Dr. J. N. White, Secretary.

At Dallas, May 1st, Mayor Henry D. Lindsley announced the appointment of the new Board of Health, of which he is ex-officio chairman. It is as follows: Drs. R. W. Baird, C. M. Grigsby, W. J. Calvert, S. E. Milliken, John D. McReynolds, E. J. Reeves, and Bush Jones. Also Messrs. S. J. Hay, J. C. Duke, S. H. Boren, H. H. Adams, and Edward Titche.

Deaths.

At Corpus Christi, March 3rd, Dr. W. H. Orr, editor and publisher of the Corpus Christi Crony, died at his home, aged 58 years.

At Fredericksburg, December 21st, Dr. Albert Keidel died at his home, aged 62 years.

At Texarkana, April 11th, Dr. George C. Abell died at his sanitarium from cerebro-spinal meningitis, aged 54 years.

At Amarillo, April 5th, Dr. William B. Patton died of septicemia, aged 45 years.

At Lancaster, March 20th, Dr. James O. A. Pipkin died at his home.

At Somerville, March 29th, Dr. Harney Upshaw died, aged 69 years.

At Abernathy, March 7th, Dr. Eugene M. Legg died, aged 36 years.

VIRGINIA.

At Richmond the medical inspection of school children during the year 1914 showed 7,415 children were examined, 19,505 were inspected, 1,547 were referred to family physicians, 2,223 were referred to the dentist, 2,234 were treated by a physician or dentist and 381 were taken to the dispensary. In addition, the nurses gave 4,681

(Continued on page xxviii.)

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AS A
Dependent, Defective and Delinquent

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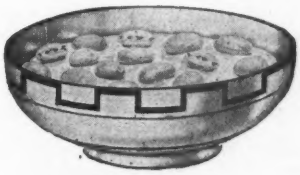
ALABAMA EXAMINATION—The next regular examination by the State Board of Medical Examiners of Alabama will begin on Tuesday, July 6th, and will close on Friday, July 9th, 1915. Applicants must register on Monday, July 5th, as the registration book will be closed at 8:30 p. m. of that day. Registration and examination will take place at the State Capitol, Montgomery, Ala. W. H. SANDERS, M. D., Chairman, Board of Examiners.



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For Easy Digestion

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Puffed Wheat, 12c
Puffed Rice, 15c
Except in Extreme West

CORN PUFFS 15¢

The Quaker Oats Company
Sole Makers—Chicago (936)

(Continued from page xxvi.)

treatments to mild skin and scalp diseases and to slight wounds and abrasions, and made 3,554 home visits.

At Norfolk the Board of Aldermen decided not to levy any license tax upon physicians. The Norfolk Medical Society has requested the Common Council to repeal the city ordinance regulating the sale of habit-forming drugs. They wish the matter to be controlled entirely by the Harrison act.

The Virginia Health Department has sent two of its inspectors, Drs. J. Thompson Booth and W. S. Keister, to the south side and tide water counties to begin a campaign against malaria.

At a special meeting of the board of visitors of the Medical College of Virginia, March 23rd, Dr. Frederick M. Hanes was elected to succeed Dr. Francis Upshur, resigned, as professor of pharmacology and therapeutics; Dr. Rosheir W. Miller was elected to succeed Dr. Leslie B. Wiggs, resigned, as associate professor of materia medica, and Dr. Greer Baughman was elected to succeed Dr. John F. Winn, deceased, as professor of obstetrics. All other professors and associates were re-elected.

Dr. Cary Grayson, U. S. N., has accepted an invitation to deliver the annual address before the Alumni Association of William and Mary's College, of which he is an alumnus, in June.

Dr. Allen W. Freeman, Assistant State Health Commissioner since 1908, has resigned to accept the position of epidemiologist for the U. S. Public Health Service.

On January 28th there was organized at Williamsburg a society of the superintendents of insane asylums in Virginia. Dr. J. D. DeJarnette was elected president and Dr. A. F. Priddy, secretary.

Deaths.

At Danville, Dr. James S. Irvin died suddenly of heart trouble in the General Hospital. After completing a difficult operation he suddenly complained of feeling ill, and died in less than two hours. His age was 47 years. Physicians from every town within a radius of 50 miles attended the funeral.

At Martinsville, Dr. H. M. Drewry died at the home of his son-in-law, Judge Whittle, April 11th. He had retired from practice on account of old age.

At Martinsville, April 1st, Dr. J. H. Turner died from senile debility, aged 89 years.

At Covesville, Dr. A. Bledsoe Wayland died.

At Martinsville, Dr. George E. Waller died February 2nd. He was a surgeon in the Confederate army.

On January 24th, Dr. Thomas F. Keen died in Hamilton.

On January 17th, Dr. Sam W. Gibson died at Castlewood. He was a Confederate surgeon.

On January 9th, Dr. Hunter H. Powell died in Cleveland, aged 71 years.

WEST VIRGINIA.

At Wheeling on Public Health Day there was a remarkable cleaning up by the city, and it is in a more sanitary condition than it has been for a long time. During April there were several cases of scarlet fever in the city. City Health Officer, Dr. W. C. Etzler, has superintended the inspection of the back yards of Wheeling for the Rotary Club. The club offers substantial cash prizes to boys and girls of fourteen years and younger from May 15th to August 1st.

At Fairmont, where typhoid fever was feared, the state bacteriologist has examined the city water and recommends that though it is comparatively pure it would be better to boil that used for drinking purposes. At the same time the city wells are condemned as the water is found extremely polluted.

At Charleston Dr. O. L. Aultz has been appointed health commissioner by Mayor Breece.

On April 27th fifty physicians, representing every part of the state, were in the city attending the meeting of the State Board of Health, which was holding a school of instruction.

Deaths.

At Moundsville, May 3rd, Dr. I. N. Houston died at his residence, aged 65 years, after a lingering illness.

At Petersburg, April 4th, Dr. William H. Siple died at his home.

At New Haven, March 27th, Dr. David A. Sayre died in his office, aged 53 years.

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Dr. Henry Froehling, of Froehling and Robertson, Chemists, Richmond, Virginia, on October 30th, 1914 collected in person water from Stafford Springs from which to make an exhaustive test. A complete report has just been made on the water---a report that justifies all the claims made of Stafford Water by its many friends.

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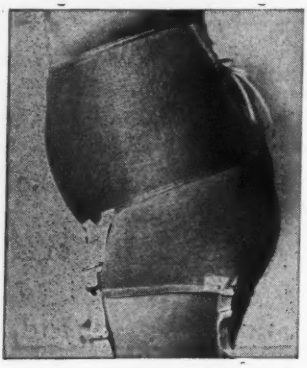

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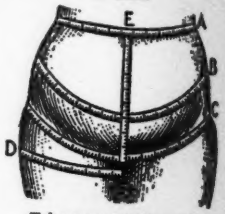

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4 level tablespoonfuls

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